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7 December 1981

JAPAN REPORT

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MILITARY

JAPAN, U.S. TO COOPERATE IN MILITARY R & D

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 pp 5, 6

[Text]

Japan and the United States have agreed to promote joint research and development of weapons systems and military technologies apparently to standardize their defense equipment and increase their technological capabilities through exchange of engineers.

The agreement came at talks between Hiroshi Wada, Director-General of the Japanese Defense Agency's Equipment Bureau, and U.S. Undersecretary of Defense Richard Delauer in Washington Sept. 18, Wada told a press conference on his return from his U.S. trip in late September.

They also agreed that the two countries will discuss specific weapon and technology items for joint research and development at their third regular consultation on defense equipment and technology in Tokyo by the end of this year, and conclude a governmental arrangement for such cooperation, Wada said, adding no specific research and development items have been proposed yet.

Apart from joint research and development, Wada said, he told the Americans that Japan can transfer its commercial technologies, which could be used for military purposes, to the United States. The Americans had requested Japan to supply the U.S. forces with its advanced technologies for military purposes.

When the U.S. request was made earlier this year, the transfer of military technologies to the United States was believed likely to violate Japan's arms export ban policy. But the Japanese government has judged the Japan-U.S. joint research and development of weapons as well as such technology transfer would not run counter to the arms export ban policy.

CSO: 4120/60

MILITARY

JDA TO CONDUCT JOINT STUDY WITH U.S. ON PATRIOT

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 pp 6, 7

[Text]

The Air Self-Defense Force (ASDF) and the Ground Self-Defense Force (GSDF) are expected to conduct a joint study with the United States on their possible introduction of the U.S. Army/Raytheon Patriot surface-to-air missile (SAM) system in the second half of FY 1982 after signing a memorandum of understanding (MOU) and a foreign military sales (FMS) contract with that country on the study in the first half.

The Patriot has been considered as a promising candidate for the two services' SAM-X system to replace the ASDF Nike-J and the GSDF basic Hawk.

Although the two services have so far collected data on the Patriot through dispatch of missions to the United States, their survey team, sent last spring, acknowledged that no progress is likely in their survey on the U.S. missile unless they conclude the MOU and FMS contract to conduct the joint study with the Americans. West Germany has carried out a similar study with the United States on the same missile.

Based on the survey results, the two services have earmarked a total of ¥500 million in the JDA's FY 1982 budget request for the joint study with the Americans. They plan to send three officials each to the United States for the study.

If the study is implemented as scheduled, the JDA could make a final decision on the introduction of the SAM-X by the end of FY 1983 to start funding of the new SAMs in FY 1984. The decision would also involve whether the ASDF and GSDF should procure the same type simultaneously.

Although the GSDF considers only the Patriot as a replacement of the basic Hawk, the ASDF is studying the Nike-Phoenix as well. The Nike-Phoenix, now in research by JDA's Technical R&D Institute, is a mixture of the Nike-J and the Hughes Phoenix air-to-air missile system for the U.S. Navy/Grumman F-14 fighter. The ASDF has set aside \$20 million in the FY 1982 budget request for this research.

But the ASDF's adoption of the Nike-Phoenix for the SAM-X is seen as unlikely, due to such problems as a long development period. The service is believed to be inclined to adopt the Patriot.

CSO: 4120/60

MILITARY

JDA STARTS CONSTRUCTION OF CENTRAL COMMAND SYSTEM

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 p 7

[Text]

The JDA has started the construction of a two-story building at its site in Roppongi, Tokyo, to house a central command system for unified command of the three SDF services in emergency.

The central command system, under planning since FY 1977, is expected to become operational in September 1983.

The FY 1981 budget sets aside ¥2,000 million for the construction of the building, which will also have three underground stories. In its FY 1982 budget request, the JDA has sought ¥6,759 million for additional construction work and procurement of hardware equipment. Total cost for building the central command post is estimated at a range of ¥9,000 million to 10,000 million.

CSO: 4120/60

MILITARY

ASDF TO NAME 220 MEN FOR E-2C DEPLOYMENT

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 pp 7, 8

[Text]

The ASDF plans to name about 220 servicemen in preparation for introduction of the Grumman E-2C airborne early warning aircraft in FY 1982, when the first two E-2Cs will be delivered to the service. These servicemen will be stationed mainly at Misawa and Iruma Air Bases prior to formation of warning flight squadrons.

Of these men, more than 10 will be planning personnel for such squadrons at Misawa Base. About 100 men will be attached to the Air Proving Wing to test the first two E-2Cs from the last quarter of FY 1982. This number of service personnel will be necessary because the E-2C's computer capacity is almost two times that of the current BADGE automatic air defense system.

At Iruma Base, about 50 men will form an E-2C program control group in addition to the existing BADGE program control group.

Another 50 men will be stationed at Misawa Base's air defense center to handle a communications buffer between the E-2Cs and the BADGE system, which the ASDF will acquire in FY 1982. Several more personnel will be needed for the E-2C program at the base's supply depot.

Meanwhile, the ASDF intends to elevate the Communications & Electronics Section of the Defense Department's Operations Division to a Communications & Electronics Division to undertake electronic warfare operations as well as management of the BADGE, the E-2C and surface-to-air missiles.

CSO: 4120/60

MILITARY

GSDP, ASDP TO SEEK CH-X FUNDING IN FY 1983

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 8, 9

[Text]

The GSDP and ASDP are expected to seek funding of their first CH-X new large transport helicopters simultaneously in FY 1983 with the same type selected, because the two services, intend to use the new helicopters for somewhat similar missions. A promising candidate for the CH-X helicopters is the Boeing Vertol CH-47-414.

The GSDP has agreed with the JDA's internal bureaus that its KHI KV-107 transport helicopters should be replaced by new larger models. Based on this agreement, the service intends to seek funding of the first two CH-X aircraft for training in FY 1983 and start a full-scale CH-X procurement program under the FY 1983-87 Medium-Term Defense Program (MTDP) to be drafted by the end of FY 1981 or March 1982.

Prior to the procurement, the GSDP has requested funds for a survey on selection of the CH-X to be disbursed in FY 1982.

The ASDP has prepared a plan to procure 12 CH-X helicopters -- three each for the four regional Air Defense Forces -- for transport of personnel and equipment to radar sites and other remote spots on the basis of a review of its overall transport setup. It had intended to start their funding in FY 1981. But priority has been given to funding of Lockheed C-130H tactical fixed-wing transports so that the CH-X program has been left over for the FY 1983-87 MTDP. The service now hopes to purchase eight CH-X helicopters -- two each for the four regional Air Defense Forces -- under the new MTDP, with the first ones funded in FY 1983.

The two services are believed likely to keep close consultation on their similar CH-X projects, acknowledging they had better adopt the same helicopter.

MILITARY

ASDF REQUESTS 1,300 MISSILES FOR FIGHTERS

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 p 6

[Text]

The Air Self-Defense Force (ASDF) has sought ¥46,320 million to purchase some 1,300 missiles for fighters in its FY 1982 budget request, according to informed sources.

The procurement will include approximately 380 AIM-7F Sparrow air-to-air missiles (¥23,830 million) for the F-15J interceptor-fighters, 890 AIM-9L Sidewinder AAMs (¥18,600 million) for the F-15Js, and 30 ASM-1 antiship missiles for the F-1 support fighters.

Funding for these three types of missiles started in FY 1980. FY 1981 funding covered 168 AIM-7Fs (¥9,510 million), 171 AIM-9Ls (¥5,435 million) and 25 ASM-1s (¥3,165 million).

The ASM-1 has been developed and produced by MHI, while the AIM-7F is domestically produced under license with Raytheon. Funding for the Raytheon AIM-9L, in FY 1981 and thereafter will be subject to licensing for domestic production.

CSO: 4120/60

MILITARY

SECOND BUFFER SYSTEM FOR ASDF E-2C

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 p 6

[Text]

The ASDF intends to order the second communications buffer system for the Grumman E-2C airborne early warning aircraft in FY 1982, following the first system funded in FY 1980. It has already set aside ¥2,400 million for the second system in its FY 1982 budget request.

The system, proposed by Hitachi, Ltd. with technical assistance from Rockwell-Collins, will be used to link the E-2C flying radar to the BADGE air defense system.

The first buffer system is to be delivered to the ASDF by the end of FY 1983 for service at the Northern Air Defense Command. The second one is planned for the Western ADC. The ASDF is expected to request a third system for the Central ADC in FY 1983 and a fourth one for the Southwestern ADC in FY 1984.

CSO: 4120/60

MILITARY

MSDF TO ACQUIRE SIX NEW PG'S BY FY 1990

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 p 7

[Text]

The Maritime Self-Defense Force (MSDF) intends to acquire six new 250-ton PG patrol gunboats for two squadrons by the end of FY 1990 to replace the existing five 100-ton PT torpedo boats which will be retired at an annual rate of one vessel from FY 1986 to 1990. The first three new PGs may have to be procured by FY 1988 to make up for the retirement of that many PTs.

The MSDF has sought ¥2,788 million in its FY 1982 budget request to build a prototype PG for operational evaluation in FY 1983-84 prior to full-scale procurement. It hopes that all six vessels will be funded under the FY 1983-87 Medium-Term Defense Program now in preparation.

The MHI-proposed slide type is expected to be adopted for the new PG because Boeing's sophisticated computer-controlled hydrofoil type, proposed by Hitachi Shipbuilding & Engineering Co., could cost too much money, according to one report.

The new PG will be armed with the McDonnell-Douglas Harpoon surface-to-surface missile and the OTO Melara 76mm gun to undertake limited interception and coastal patrol missions. Its maximum speed is planned at more than 40 knots. If such speed is achieved with mounting of advanced electronic systems, the boat could be used for antisubmarine operations as well.

CSO: 4120/60

MILITARY

G/MSDF REQUESTS 13 CHUKAR II DRONES IN FY 1982

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 pp 7, 8

[Text]

The Ground and Maritime Self-Defense Forces (GSDF and MSDF) have sought 13 Northrop Chukar II target drones in their FY 1983 budget request, following the first five units funded in FY 1981.

The 13 units comprise six for the GSDF and seven for the MSDF. The first five were comprised of one for the GSDF and four for the MSDF.

The GSDF plans to use the new drones for trainings in firing the Tan-SAM short-range surface-to-air missile, which the service is to introduce for air defense of GSDF divisions under the FY 1981 budget.

The MSDF intends to use such drones for the Sea Sparrow SAMs to be mounted on destroyers funded from FY 1975 to 1977.

The Chukar II drones will be produced by Nippon Electric Co. (NEC) under Northrop license. But knock-down units will be imported for assembly by NEC for the drones under FY 1981 and 1982 funding. Those for funding in FY 1983 and thereafter will be subject to full-scale license production.

CSO: 4120/60

MILITARY

FIRST JU-MAT MISSILES TO BE DEPLOYED IN LATE FY 1981

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 p 8

[Text]

The GSDF will deploy its first ~~eight sets~~ of Model 79 Ju-MAT antitank/ship missiles at its Second Division at the end of the current fiscal year, two years after the KHI-developed missile was given service entry certification in 1978. An additional four sets will be delivered to the Fuji School and one more to the Ordnance School later on.

The Model 79 Ju-MAT is an advanced version of KHI's Model 64 antitank missile, Japan's first domestically-developed guided missile. The semiactive infrared guided weapon can hit a target within a four-kilometer range at a speed of 720 kilometers per hour. It measures 156.5 centimeters in length and 15.2 centimeters in diameter, and weighs 42 kilograms. Its price is ¥10 million.

One Model 79 Ju-MAT set is comprised of two launchers, sighting apparatus, communication equipment and other components.

The Ju-MAT missiles will replace the GSDF's recoilless guns to attack landing-ship tanks as well as battle tanks.

CSO: 4120/60

MILITARY

ASDF TO FIX NEW BADGE PROGRAM IN MAY 1982

Tokyo JPE AVIATION REPORT-WEEKLY in English No 543, 21 Oct 81 pp 3, 4

[Text]

The Air Self-Defense Force (ASDF) is expected to make a decision on the prime contractor and construction schedule for the new BADGE automatic air defense system by the end of May 1982, paving the way for the Japanese Defense Agency's (JDA) final decision in late July or early August before its FY 1983 budget request.

The ASDF requested Nippon Electric Co., Hitachi Ltd. and Fujitsu Ltd. last Aug. 7 to submit their proposals on the new BADGE by the end of January 1982. It expects to take about four months to evaluate these proposals before the decision.

The ASDF's decision will be studied by the internal bureaus of the JDA and the National Defense Council until the FY 1983 budget request is made up in late August 1982, when the JDA may seek funds to start construction of the new BADGE.

The ASDF is required to build the new BADGE with increased capability as early as possible to handle such sophisticated equipment as the F-15J fighter-interceptor, the E-2C airborne early warning aircraft and the SAM-X next-generation surface-to-air missile system.

The new BADGE construction program may be one of the ASDF's top priority projects under the FY 1983-87 Medium-Term Defense Program to be worked out by the end of FY 1982.

CSO: 4120/60

MILITARY

ASDF TO UNIFY 20MM GUNS INTO VADS

Tokyo JPE AVIATION REPORT-WEEKLY in English No 543, 21 Oct 81 p 4

[Text]

The ASDF is expected to procure only Vulcan Air Defense Systems (VADS) as its 20mm antiaircraft gun systems for air base defense, though it has so far considered not only the VADS but also a modified version of the 20mm Vulcan gun system aboard the retiring F-104J fighter.

The service is to fabricate and test two modified Vulcan systems through a private contractor under the FY 1981 budget. But it is unlikely to adopt the modified Vulcan system which has no fire control radar, because Japan's license production of the more advanced VADS is seen as possible.

It has sought funding of 16 VADS sets in its FY 1982 budget request on the basis of evaluation of four sets funded in FY 1979. Their license production will be undertaken by the contractor for modification of the 20mm Vulcan gun system.

The 20mm antiaircraft gun systems will be deployed at air bases and radar sites together with short-range and portable surface-to-air missiles. VADS procurement is expected to amount to about 350 sets.

CSO: 4120/60

MILITARY

MSDF ADOPTS MK-46 AS NEW SHORT-RANGE TORPEDO

Tokyo JPE AVIATION REPORT-WEEKLY in English No 543, 21 Oct 81 p 5

[Text]

The MSDF has adopted the U.S. Navy MK-46MOD-5 short-range antisubmarine torpedo as the replacement for the Model 73 torpedo prior to full-scale procurement starting in FY 1982, although the modified Model 73 has been developed as the replacement.

The service had sought procurement of the modified Model 73 torpedoes in its FY 1982 budget request. But the U.S. Navy has agreed to release the MK-46 for Japan's license production, leading the MSDF to switch from the modified Model 73 to the MK-46MOD-5.

The U.S. Navy has approved Japan's license production of the MK-46MOD-5, except for the guidance system, in the immediate future. The torpedoes for FY 1982 funding will be subject to partial license production with the guidance systems imported. The guidance system is expected to be released in the late 1980s, enabling Japan's full-scale license production. MHI has been named to undertake the license production.

CSO: 4120/60

MILITARY

JAPAN, U.S. TO EXCHANGE DEFENSE TECHNOLOGY EXPERTS

Tokyo JPE AVIATION REPORT-WEEKLY in English No 544, 28 Oct 81 pp 7, 8

[Text]

Japan and the United States are expected to start their cooperation in military technology with exchange of technical experts on a governmental basis.

They may reach agreement on the exchange at their third regular consultation on defense equipment and technology scheduled for late this year, according to Japanese Defense Agency sources.

Recent talks between Japanese and U.S. defense officials included the working-level security consultation in Hawaii last June and JDA Equipment Bureau Director-General Hiroshi Wada's meetings with U.S. officials in Washington in September. At these talks, the Americans reportedly asked the Japanese to transfer Japan's advanced commercial electronic and optic technologies and to start joint research and development of defense technologies.

The Japanese see the exchange of defense technology specialists as the first step of Japan-U.S. governmental military research and development. Through the exchange, Japanese and U.S. experts could discuss technologies of common concern in detail and get to know each other's national technological levels and development capability. Thus they could work on technologies and arrangements for joint research and development smoothly.

One of the major topics for expert discussion would be how to promote interoperational capability of Japanese and U.S. defense equipment to contend with future emergencies effectively.

If the exchange of military technology experts makes smooth headway, the two countries could launch joint development and production of weapons systems.

On the subject of technology transfer, the Japanese have reportedly told the Americans that Japan can export commercial technologies for military purposes to the United States notwithstanding its policy of banning arms exports.

Although U.S. officials have yet to specify the Japanese technologies requested for the transfer, Japanese government and industry sources say that the know-how the Americans want includes ultra-high-speed integrated circuits (UHSIC) and low-loss fiber optic transmission cables, according to unofficial notices from the U.S. Department of Defense. The Americans may reveal the specific technological transfer requests at the defense equipment and technology consultation get-together later this year.

Japanese industry pioneered remarkable development of UHSIC and fiber optic technologies for commercial purposes in the 1970s; America failed to promote full-fledged development.

The UHSIC will bring about smaller-sized IFF (identification, friend or foe) and guidance systems for missile warheads and speed up data processing to improve the missiles' hit ratio. It will also sharply improve performance of fire-control systems aboard fighter aircraft and electronic warfare systems.

In the 1970s, the U.S. Department of Defense cut its subsidies to industry for development of the UHSIC, expecting the industrial sector to develop the technology on its own. But the private sector centered efforts on research into large-capacity memory chips rather than high-speed ICs, leaving the United States lagging behind Japan in the UHSIC field.

The fiber optic technologies have already been applied by the U.S. Air Force and Navy to communications systems of aircraft and submarines. But the Pentagon has been slow in making further progress in such technologies. In the meantime, Japan has taken the lead in development of low-loss fiber optic cables that enable large-capacity, long-range communications.

MILITARY

ASDF TO SET UP AD HOC F-15 SQUADRON IN DECEMBER

Tokyo JPE AVIATION REPORT-WEEKLY in English No 544, 28 Oct 81 pp 8, 9

[Text]

The ASDF is expected to inaugurate an ad hoc squadron of one F-15J fighter and two F-15DJ trainers in mid-December after approval by the Minister for Defense (JDA Director-General) on F-15J deployment.

The F-15J fighter for the ad hoc squadron is the first one produced by MHI under license by McDonnell Douglas Corp. (MDC), and will be delivered to the ASDF in December after on-going tests.

The two-seater trainers, now used in the United States for training ASDF pilots, will be transferred to Japan by U.S. Air Force pilots around Nov. 20.

Two F-15Js imported from MDC arrived at Gifu ASDF Base last March 27 for operational tests by the ASDF Air Proving Wing. A report on the tests will be submitted to the Air Staff Office in November. Based on this report, the ASDF Chief of Staff will file an application with the minister for approval of F-15J deployment.

When approved, the ad hoc squadron will be set up at Nyutabaru ASDF Base. The two F-15Js for the Air Proving Wing will continue to undergo testing. Japan's first formal F-15 squadron may be organized in the middle of FY 1982 with additional aircraft joining the ad hoc squadron.

CSO: 4120/60

MILITARY

ASDF PLANNING TO INTRODUCE CH-47 HELICOPTER

Tokyo JPE AVIATION REPORT-WEEKLY in English No 544, 28 Oct 81 p 9

[Text]

The ASDF is expected to reach a decision soon on introduction of the Boeing Vertol CH-47 Chinook as its new transport helicopter, to keep pace with Ground Self-Defense Force (GSDF), which plans to purchase the first two CH-47s in FY 1983 for pilot training.

The melding of ASDF and GSDF transport helicopters into the CH-47 model will enable Japan to obtain domestic license production of the helicopter.

The ASDF has tentatively decided to purchase a total of 10 CH-47s -- two in FY 1983, two in FY 1984, three in FY 1985 and three in FY 1986, according to informed sources. The two aircraft for FY 1983 purchase may be imported directly from the United States. Others may be subject to domestic license production.

The ASDF's new helicopter, larger than the currently-used V-107, will be used to carry equipment to radar sites and other spots without runways. Transportation between air bases with runways will be undertaken by the Lockheed C-130H and the C-1 fixed-wing transports.

CSO: 4120/60

MILITARY

ASDF TO LENGTHEN NIKE-J'S SERVICE LIFE

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 pp 4, 5

[Text]

The Japanese Defense Agency (JDA) has named Nippon Electric Co. (NEC) to serve as prime contractor for lengthening the service life of the Nike-J surface-to-air missile system for the Air Self-Defense Force (ASDF).

Although the Nike-J has been outmoded, the JDA's selection of a replacement is expected to take more time. Furthermore, the United States has notified Japan that it will discontinue supply of Nike-J spare parts in 1985. Thus the JDA has been forced to lengthen the Nike-J's service life with spare parts produced by domestic manufacturers under U.S. license until introduction of the new SAM-X system as the Nike-J replacement.

The ASDF started deployment of the Nike-J system in the early 1960s. It now has six Nike-J units. Missiles have been produced by Mitsubishi Heavy Industries Ltd. under license. Spare parts for target tracking radars, launchers, computers and other ground equipment have been supplied by the United States through its Foreign Military Sales channels.

NEC will produce these ground equipment spare parts together with Hitachi Shonan Denshi and NEC Radio Equipment Engineering, which have so far undertaken overhauling of such parts.

The ASDF has so far spent ¥7,000 to 8,000 million annually on maintenance of the Nike-J system. Even if spare parts are subjected to domestic license production, it intends to hold the maintenance spending down to the current level. It has no plan to improve the performance of the Nike-J under the new maintenance setup.

The JDA had planned to introduce the SAM-X to replace the ASDF Nike-J and the Ground Self-Defense Force's (GSDF) Hawk system in FY 1982. But the introduction may be delayed until FY 1984 due to uncertainties about the United States' production of the Raytheon Patriot SAM system, a promising candidate for Japan's SAM-X. Even if the SAM-X introduction starts in FY 1984, it could take several years to replace all Nike-J systems with the new systems.

The delay in SAM-X introduction does not directly affect the GSDF, which has been going ahead with deployment of the Improved Hawk replacing the Basic Hawk.

CSO: 4120/60

MILITARY

JDA TO SET UP NEW RADAR INSTALLATIONS AT TWO SITES

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 pp 5, 6

[Text]

The JDA is expected to set up NEC's sophisticated FPS-II fixed three-dimensional radar installations at Omaezaki in Shizuoka Prefecture in FY 1982 and at Mishima Island in Yamaguchi Prefecture in FY 1983, which would have a major bearing on the ASDF's operation of a new Base Air Defense Environment (BADGE) system in future.

The ASDF's 24 radar sites, excluding four in Okinawa, have only nine equipped with Mitsubishi Electric Corp.'s FPS-1 or NEC's FPS-II three-dimensional radar units which can promptly process data on the flight paths of intruding aircraft. Other radar sites have search and altitude observation radar units to detect three-dimensional positions of intruding aircraft. But these units cannot effectively track intruding aircraft flying at speeds of Mach 2 or more. The JDA wants to set up sophisticated three-dimensional radar units at the other radar sites, including Omaezaki and Mishima.

The Omaezaki radar site is designed to monitor Soviet aircraft operating in the Pacific, while the Mishima site is for surveillance of the strategic Tsushima Straits.

The construction of a new three-dimensional radar installation at the Mishima site may be related especially to the ASDF's introduction of Grumman's E-2C airborne early warning aircraft.

CSO: 4120/60

MILITARY

ASDF PREPARING FOR E-2C INTRODUCTION

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 pp 6, 7

[Text]

The ASDF plans to complete training of maintenance engineers and crewmen for the Grumman E-2C airborne early warning aircraft in the United States by December 1982, prior to acquisition of the first two E-2Cs in January 1983.

The first four maintenance engineers left for the United States in late October to undergo training at U.S. naval facilities and at Grumman Aerospace, the maker of the E-2C. In mid-November, 20 more engineers will follow. The ASDF intends to send a total of 43 engineers, including these 25, to the United States in the current fiscal ending in March 1982 and another 34 in the next fiscal year.

Six pilots will go to the United States in February 1982 for two-month ground training and subsequent eight-month flight training. In addition, 12 crewmen assigned to warning and control functions will leave in March 1982 for a 37-week training period. These E-2C maintenance engineers and crewmen will return home by December 1982 to prepare for domestic training starting in FY 1983.

The ASDF is scheduled to take delivery of eight E-2Cs by FY 1985. A contract for the first four aircraft was concluded in FY 1979 under the United States' foreign military sales (FMS) system. Two of them will arrive in Japan in January 1983 for service at Misawa ASDF Base in Aomori Prefecture. The other two will be delivered in FY 1983. The FMS contract also covers the Americans' training of ASDF men for the E-2C.

Another FMS contract for the remaining four E-2Cs was signed last August. Two of them will be delivered in FY 1984 and other two in FY 1985.

The first two aircraft will be used for practical tests in FY 1983 at Misawa Base, where a communications buffer system will be completed in FY 1982 to mediate data transmission between E-2Cs and the BADGE air defense system.

They will form an ad hoc warning squadron together with two other aircraft to be delivered in the middle of FY 1983. The ad hoc squadron will conduct operational tests from late FY 1983 to FY 1984. In FY 1985 when the last two planes arrive in Japan, an official warning squadron will be organized with personnel totaling about 350 under the direct control of the Air Defense Command. It will undertake airborne warning for the Northern Air Defense Force. Its specific operation schedule is now under consideration.

The ASDF plans to use the E-2C squadron for other regions as well. It has decided to set up another communication buffer system for the Western Air Defense Force by the end of FY 1983.

CSO: 4120/60

MILITARY

SDF HELICOPTER SURVEY TEAM TO VISIT U.S. IN FY 1982

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 pp 7, 8

[Text]

The JDA intends to dispatch a joint mission of the three self-defense services to the United States in FY 1982 for a final survey on large helicopters for purchases starting in FY 1983. Funds for the survey are earmarked in the FY 1982 budget request.

The team will consist of two officials from the Ground Self-Defense Force (GSDF), two from the Maritime Self-Defense Force (MSDF) and one from the Air Self-Defense Force (ASDF), to study respective candidates for new large-size helicopters and to estimate costs for their procurement prior to the FY 1983 budget request.

The GSDF wants the Boeing Vertol CH-47 as a replacement for the KHI V-107A transport helicopter. The FY 1980-84 Medium-Term Defense Program (MTDP) requires the GSDF to purchase two new transport helicopters for crew training. Full-scale replacement of V-107As with the new helicopters is expected to be covered by the FY 1983-87 MTDP which will be prepared by the end of FY 1981.

The ASDF also views the CH-47 as a promising candidate for its new large transport helicopter.

The MSDF is seeking a replacement for the V-107 mine-sweeping helicopter. A promising candidate is the improved RH-53E, a minesweeping version of the Sikorsky CH-53E, which has been adopted by the U.S. Navy. The FY 1980-84 MTDP envisages the MSDF's purchase of six new helicopters replacing V-107s. The service expects that the FY 1983-87 MTDP would include an additional six such helicopters.

All the three services intend to launch purchase of the new large helicopters in FY 1983.

MILITARY

ARMS STANDARDIZATION AFFECTING GOVERNMENT'S TANK PLAN

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 p 8

[Text]

The United States has asked Japan to use Rheinmetall's 120mm gun for the GSDF's new main battle tank (MBT) now in development to promote the western alliance's standardization of military equipment, according to JDA sources.

The U.S. request has affected the JDA's plan to develop and produce all parts of the new MBT domestically. The JDA, which has named Japan Steel Works Co. to develop a 120mm gun for the Model 88 tank, is pondering whether to accept the U.S. request.

The Americans hope that all new tanks of the western alliance would use the Rheinmetall gun. They have adopted the gun for the MX-1 tank now in development. In line with the U.S. request, the West German gun manufacturer has indicated its readiness to allow Japan to produce its 120mm gun under license.

If the JDA decides to use the Rheinmetall gun, Japan Steel Works could lose a contract for the gun development. It has already succeeded in fabricating a prototype gun for the new MBT.

The possible adoption of the Rheinmetall gun would also force Japan to import, or produce under license, cannon-launched guided projectiles (CLGP) for the gun.

The JDA plans to develop the new Model 88 MBT by FY 1988 as the successor to the Model 74 tank.

CSO: 4120/60

CURRENT TRENDS OF FOREIGN INVESTMENT INTO COUNTRY ANALYZED

Tokyo DIGEST OF JAPANESE INDUSTRY, TECHNOLOGY in English No 163, 1981 pp 21-25

[Text]

Recent Investments in Securities

"They're buying Japan itself," is a typical comment to be heard among Japan's financial institutions and securities companies, reflecting the astonishing pace of foreign investment in Japan from last year. Some have even been comparing Japanese shares to *ukiyoe*, a traditional Japanese art genre that has long been popular in the West, equating the two.

Ministry of Finance statistics for FY 1980 (April 1980 - March 1981) arranged on a settlement basis show a net (acquisitions minus disposals) total of \$6.144 billion of Japanese stocks acquired by foreign capital, while the total for the bonds market was \$6.698 billion. Both figures are all-time high; in fact, in the case of stocks, the sum is five times more than in the previous record year, FY 1974. The net total of some \$12.842 billion for stocks and bonds market far exceeds figures for the past five years (see the Figure), and is a 7.6-fold increase over the \$1.686 billion registered in FY 1979.

Investment in stocks started rising in earnest from around August last year. In the 1st quarter of FY 1980 the inflow of foreign capital (i.e. acquisition net) was only \$871 million, but this jumped to \$2.569 billion in the 2nd quarter, evidence of the emergence of the boom in Japanese stocks. While investment can be said to have settled down after that, it is only a relative term, as the actual figures maintained high levels -

\$1.128 billion in the 3rd quarter, and \$1.575 billion in the 4th. As for the bonds market, investment by foreigners peaked around June and July, and was concentrated on government bonds. It is worthy of note, however, that unlike the situation with stocks, bond investment stabilized from the beginning of the fiscal year, and maintained high levels throughout.

Investment in Japan does not mean that in-

Trends of Stock Investment into Japan



- 1) Each Fiscal Year term is from April to March.
- 2) The total amount in each FY is a net (acquisition minus redemption).

vestment in securities, it also involves the acquisition of stock in Japanese corporations with the aim of participating in management and setting up technical tie-ups, and direct investment in the form of loans. While active investment of this type has been progressively carried out by American companies noting the improved level of Japanese electronics technology, taken as a whole there have been no changes as great as those seen in securities investment. For example, a look at stock and holdings acquired by foreign investors during calendar 1980 shows there were 684 cases of acquisition (down 10.1% from the previous year) totaling only \$328 million (down 35.3%). While this sum is not in itself small, the decline in large-scale investments can be read as signifying caution in direct investment.

Technology import agreements concluded during 1980 came to 1,747, about the same as the previous year. Also showing no change was the fact that about half of these technology imports were from America.

Underlying Power of Oil Money

Where did the funds come from for such record investments, especially into securities? The common view, expressed by the Finance Ministry and concurred with by others, is that oil money and European and American pension funds formed the major sources.

The more important of the two was oil money — the surplus funds of the oil-producing states. Financial officials estimate that of FY 1980 inflow of foreign funds into the stock and bond markets, oil money accounted for some 50 per cent and 70 — 80 per cent respectively. Oil money used to be invested mainly in Britain and the U.S., but in recent years there has been increased recycling to other major nations. Also, while

the main form of investment of such funds used to be bank deposits, short-term government securities and other such short-term assets in 1974 (over 60 per cent was in short-term assets), there has been a gradual shift to long-term investment, such as long-term government securities, and private securities. The recent investment activities in Japan by the oil-producing nations show these changes.

"What caused the rapid increase in investment in Japan was the greater quantity of oil money resulting from higher oil prices, plus changes in the

stance of the Japanese government toward foreign capital, and the advance of internationalization. Japan has a huge, established economic infrastructure . . . The Japanese financial market is essential to us." These are the words of Saudi Arabia's Al Quraishi, Chairman of the Board of Directors of the Saudi Arabian Monetary Agency (SAMA). What is most surprising though considering how fussy SAMA has been about maintenance of secrecy pertaining to details of its fund investments, is their remark that they are "placing the emphasis on investment in stocks and bonds," showing they have started to talk openly about the nation's oil money investment strategy.

In fact, in spring this year SAMA reached agreement with two of Britain's leading merchant banks, in line with which about \$1 billion of assets in the form of Japanese stocks and shares were to be deposited there for investment purposes. With the pro-

portion of surplus funds being invested in the form of yen assets expected to increase, there is no lack of factors for increased investment activities by foreigners. And not only Saudi Arabia; in other oil-producing nations, too, Japanese investment fever has reached new heights. Another feature was the stepped-up investment in Japan by U.S. and European pension funds, from the start of the year. Pension funds are said to total \$600 billion in America and £35 billion in U.K., and with the easing of governmental restrictions in the countries concerned, overseas investment is proceeding steadily. Japan is now a recipient of this wave of money: excluding oil money, in the case of stocks the usual view is that most of the inflow of foreign money has come from pension funds.

Assessment of Japanese Economy

When looking at the background to the high rate of investment in Japan, assessment of the fundamentals of the economy is of course highly important. Foreign capital is very sensitive to economic trends and moves, and it goes without saying that the very fact that Japan was selected as a safe and profitable harbor for investment shows how highly rated is the power of Japanese economy. According to a recent OECD (Organization for Economic Cooperation and Development) report on the economic prospects of OECD member nations, Japan will have a real economic growth of 3.5 per cent in 1981 and 4 per cent in 1982, while in the case of West Germany the rate would be minus 1.5 per cent, 2 per cent and for the U.S. 2.5 per cent, 1 per cent respectively; so Japan again comes out top among other leading nations. Judging from

the tone of the OECD report, that recovery is lagging and the pace of expansion is slow, the steady recovery in the Japanese economy makes Japan "a unique pump-primer" with regard to the oil-producing countries' oil money and the pension funds of leading nations.

The rapid increase in issues of foreign bonds by the corporations of Japan also testifies to the high level of confidence Japan enjoys from other countries. In FY 1980 there were 114 such bond issues, totaling a record \$3.654 billion. Recently Canon, leading manufacturer of cameras, placed a private \$50 million issue of con-

vertible debentures; in fact such issues, in the U.S. are becoming very popular, as companies here take advantage of the booming investment in Japan. This contrasts well with the \$1.4 billion or so of bonds floated on the Japanese market by foreign enterprises. In fact some specialists are even cautioning lest capital procurement develop into trade friction.

Future Prospects and Problems Japan Will Face

On the surface foreign investment in Japan is proceeding well, but from the start of the new financial year beginning this April, there has been some change in what had previously been a general buying attitude. The effect of high American interest rates and the drop in the yen has been to slow the pace of foreign investment in Japanese bonds. So, in May, for the first time in 14 months, redemptions exceeded acquisitions, to the tune of \$384 million.

On this point Takashi Kato, Director-General of the Finance Ministry's international

Finance Bureau, commented that the reason was not a move away by oil money etc.; it was, instead, just that there was a decrease in the inflow of capital. He went on to say that although the effect of the high American interest rates was being felt, he didn't feel a negative flow balance would develop.

Foreign investment in shares maintained a good level in June. Officials feel that as long as the Japanese economy remains fundamentally sound, even though there may be some temporary ups and downs, foreign investors will not direct their attention elsewhere.

The view is that, taking FY 1981 as a whole, active investment in Japan will continue, fueled by funds from the oil-producing nations. While there is a measure of concern over how long the high interest rates will continue in America, such negative factors will not be enough as to cause any major change in the basic inflow of foreign investment. The news of the return of oil money to the West German stock market is a good omen for this, because taken together with the improvement in West Germany's current account balance, it gives rise to the assessment that oil money will not be diverted elsewhere provided the economy is sound. While at present much of the oil money continues to be put into high-interest, short-term dollar investments, the moves in West Germany may indicate future course of the oil-producing countries of the Middle East.

In addition to a policy of recycling oil money through the IMF (International Monetary Fund) and other international organizations, Japan, meaning both the government and private sectors, must not

neglect efforts to make Tokyo one of international financial markets in name and fact.

Investment in Japanese securities was greatly eased by the Foreign Exchange Law revision of last December, and continuing on from this, it is hoped that the expansion of yen-based transactions by Japanese banks will form a conduit for the flow of oil money. ■

ECONOMIC

CONFLICT BETWEEN POSTAL SAVINGS, BANKS CONTINUES

Tokyo JIHYO in Japanese Oct 81 pp 60-65

[Text] In Kasumigaseki this summer the hottest topic was the conflict between postal savings and the banks. The conflict escalated when the Finance Ministry entered on the side of the banks. The Ministry of Posts and Telecommunications is using public opinion to help it through the crisis.

Historical Turning Point

It has been years since the Ministry of Posts and Telecommunications has had a summer as busy as this year. Vice Minister Asao and the bureau, division and department heads skipped their summer vacations and called on the staff of the LDP Policy Affairs Research Council and opposition party leaders, held briefings for media representatives, and spent days on end in the ministry holding conferences and buried in work. Minister Yamanouchi invariably attended ministry conferences to urge them on.

Minister Yamanouchi gives orders with his face flushed: "These issues are not only vital to the Ministry of Posts, they are serious matters with grave effects on how the people live. Now is the time for the ministry to rouse itself and make every effort."

These are not just words--these really are grave issues for the Ministry of Posts and Telecommunications. When they meet former classmates in other ministries, the division chiefs hear things like, "your eyes are all bloodshot," or "you're so stirred up." It's not likely the whole ministry will be so excited again. The division chiefs realize they have come to a turning point in history.

There are two grave matters. One is that the well-known conflict between postal savings and the banks is nearing a showdown. The other is that telecommunications policies have begun to change--such issues as the opening up of data communications circuits and the revision of the broadcasting law. In both cases the direct users are the Japanese people. To the extent that the Ministry of Posts and Telecommunications is directly involved in upgrading the lives of the people, these policy changes directly affect the Japanese masses. The wording of Minister Yamanouchi's instructions is not the least bit exaggerated.

Advent of Protectors of the Elite

There was a noteworthy Diet interpellation on 20 August. This was the response of the "Discussion Group on Government Involvement in the Field of Finance," an organization with a lengthy title which advises the prime minister.

The conclusion was known from the beginning. When it was organized this January, media representatives and even some government officials said the "selection of personnel was hardly impartial." In addition to Chairman Hiromi Arisawa, there were Jiro Enjoji, Saburo Okita, Kiyoshi Tsuchiya and Ichiro Yoshikuni. Certainly these are all men of eminent scholarship and experience, but they are all macroeconomic specialists. They are well versed in monetary and fiscal matters, and they therefore lean toward the Ministry of Finance. This means they lean toward the banks, and ultimately, away from postal savings.

On seeing this lineup, the division chiefs of the Ministry of Posts and Telecommunications muttered that this was "a prime example of the 'wise men' system." One division chief said: "The guardian angels of the elite have come to subdue an insurrection of the masses."

The postal savings plan commenced in 1875. It was aimed at the common people who were not involved with private financial institutions, and has continued as a depository for small, hard-earned savings. It could be called a matter of gleaning. The private financial institutions put cost ahead of all else. That is natural, since they are profit-making enterprises. They do not have branches in remote locations, and they do not deal with small deposits because of the relatively high cost. They inevitably concentrate on business finances.

Since the Meiji period (late 19th century) the national policy has been promotion of thrift for national prosperity and military strength. After World War II this became a policy of high growth with emphasis on heavy industry and chemicals. At all times, the private financial institutions have been the main source of financial support for the development of enterprises. As the economy grew, the private financial institutions expanded and became the financial mainstream. Government financial policy has been in the hands of the Ministry of Finance and the Bank of Japan, which have given guidance to the private financial institutions with ties to them.

In the meantime, postal savings have meandered along as a side stream. They have not had much impact on business, but they are more directly tied to the life of the masses than the private financial institutions. It is to the post office that the people, wiping away the sweat as they walk in the hot summer sun and saying "hello, how are you" to their neighbors, take their meager savings.

Behind the Scenes of the Postal Savings Discussion Group

In 1980 there was a sudden increase in postal savings which was greeted with screams from the private financial institutions and their backer, the Ministry of Finance. As seen by this elite group, this was an uprising in which the base of the elite was threatened by the very unelite postal savings. In that year, postal savings deposits grew to 60 trillion yen, some 30 percent of all personal savings.

The Ministry of Finance is nothing if not political. Leading executives of the LDP are almost all former finance ministers or their sympathizers. The ministry has extraordinary influence with mass media circles which mold public opinion. News sources for the newspaper financial reporters are limited to the Bank of Japan and the Ministry of Finance, and by extension the private financial institutions. They are close indeed.

The Ministry of Posts and Telecommunications, on the other hand, is not elite as far as financial policy is concerned; it is only a side stream; the media people who deal with postal matters are not well-versed in finance. Its power relationship with the political world and with public opinion is obvious. But it does have an ally in the common people. The close bond which has been built up between the post office and the people over the past century cannot be broken, even by the strength of the Finance Ministry group.

Thus the Ministry of Finance mobilized its sympathizers and "old boys" within the LDP and had Prime Minister Suzuki establish the postal savings discussion group. That is what was meant by the Ministry of Posts division chief's mention of the elite subduing the insurrection of the masses. There is certainly some truth in that. Looking at the origin of the postal savings discussion study group, it was clear from the outset that its report would be slanted toward the private financial institution-Ministry of Finance combination. The postal savings system exists only because it is supported by the Japanese masses; judged by the theories of financial policy it is strictly anti-mainstream. Scholars are generally on the side of compatibility with theory rather than reality.

The report of the discussion group was as expected. It took the position that interest rates must be unified and that the law should be changed to accomplish that. It also said the role of government should complement that of private enterprise; it is clearly a movement in the direction of reviewing fixed deposits and the autonomous operation of postal savings.

Growing Sense of Crisis in the Ministry of Posts

On the same day, the Ministry of Posts and Telecommunications published its views and the minister remarked on the content of the discussion group report. Minister Yamanouchi said: "It ignores the position of the savers--the people of Japan--and is completely unacceptable." This was a hardline stance on disregarding the report. Yamanouchi took the angry position that if the prime minister asked the cabinet to accept the report as received, he would resign immediately.

The Ministry of Posts and Telecommunications, on the basis primarily of the views of Postal Savings Bureau Director General Koichiro Kamo, took the report to task forcefully: "The increase in postal savings is a choice made by the people, and to artificially restrict it would run counter to the needs of the people. Therefore, to restrict the share held by postal savings by degrading fixed deposits, freezing the ceiling and reviewing the collection allowance would be a reversal of the proper order."

"Enhancement of personal finances is called for, whether through government or private institutions, and restriction of improvements in service cannot be tolerated in the least."

"Degrading the commercial content of fixed deposits is mentioned, but that would go against the interest of the savers, and cannot be agreed to."

"It emphasizes the position of financial policy and ignores the position of the people; this is deplorable."

This is the first time a government administrative agency has made such an attack on the report of an advisory body of the prime minister. It indicates the intensity of the sense of crisis in the Ministry of Posts and Telecommunications. But one should not overlook the ministry's pride in being in the right and having the support of the people.

In June the ministry carried out a national survey of 5,000 scholars and media representatives. The result showed that 64 percent opposed unification of interest rates. Because individual savings and corporate savings differ in nature, there should be no objection to the present dual interest system. With regard to fixed deposits, 87 percent said "the private financial institutions should make greater efforts." On the relationship between government and private enterprise, about 70 percent said "financial services for individuals should be improved, whether by government or by private institutions."

Entangled in a Long Struggle

It is the trend of public opinion which is of greatest concern to Director General Kamo and other officials of the Ministry of Posts and Telecommunications. The Suzuki cabinet can, from the nature of the prime minister, be called a "public opinion" cabinet. It has unprecedented sensitivity to public opinion. In an earlier incident, the Foreign Ministry was scolded in connection with the communique on the Japanese-U.S. summit talks, and Foreign Minister Ito resigned; that was a reaction to severe criticism of the communique in newspaper editorials.

The morning after the report was released to the newspapers, executives of the Ministry of Posts and Telecommunications all pored over the editorials in the various newspapers. Some papers supported the report, but that was not the case with influential papers like MAINICHI and ASAHI. They found fault, using such phrases as "unification of interest rates is inappropriate from the perspective of social justice," "at a time of growing distrust for private financial institutions, the people will not be persuaded to have fixed deposits reconsidered or to stop expansion of financing to individuals," and "they say wealth will grow as postal savings increase, but the problem is that the special corporations remain as always." This does not mean that they endorsed everything the Ministry of Posts and Telecommunications said, but they did say there are clearly many problems with the discussion group's report.

Director General Kamo and the others appeared relieved. But victory is not won yet. What will the LDP do? How will the opposition parties respond? Of the opposition parties, the New Liberal Club and the DSP support the report; the JSP, Komeito and JCP oppose it; the all-important LDP is divided. The Finance Ministry "old boys" and sympathizers have a strong voice within the LDP. They hold most of the key party posts and also control the Policy Affairs Research Council. But Ministry of Posts sympathizers must rely on numbers.

For the last year, Chairman Moribe and the LDP Telecommunications Section have been studying the financial system with an intensity even financial scholars find impressive. From time to time they have held discussions with media and academic representatives, who have expressed surprise that these "Diet members have been studying so hard lately." In addition to studying, they have collected sympathizers in the party. More than 300 LDP Diet members have already stated their support for the views of the Telecommunications Section. Vice Minister Asao and Director General Kamo have taken the lead in attending these meetings, and the division chiefs have, needless to say, put great effort into preparation of background materials.

The post offices across the country have gotten "votes" instead of getting money for political contributions. Back when former Prime Minister Kakuei Tanaka came on the scene as a young minister of posts and telecommunications, he wrote these on colored paper in his practiced hand, and distributed them to designated post offices across the country. As minister of posts and telecommunications, Tanaka's relationship with postal authorities was unsteady, but now he is very close to the minister. He is making every effort to recruit sympathizers within the party.

"It will be a long struggle," says Director General Kamo. The Postal Ministry has delayed its personnel shifts as it prepares for this emergency. Director General Kamo and his staff in the Postal Savings Bureau have kept up their efforts through the rotation period. But in any case, they have been drawn into a protracted war with the Ministry of Finance and the private financial institutions. It appears that Prime Minister Suzuki is also playing for time. Wars of endurance are a specialty of the Finance Ministry, which is gradually gaining sympathizers and turning public opinion its way. This will test the tenacity of the Ministry of Posts and Telecommunications.

9601
CSO: 4105/9

SCIENCE AND TECHNOLOGY

FY-80 SCIENCE, TECHNOLOGY WHITE PAPER SUMMARIZED

Tokyo KAGUKU SHIMBUN in Japanese 7 Aug 81 p 1

[Text] Japan Grows to a "10 Percent Country" in Both Research Spending and Number of Researchers; 1980 Science and Technology White Paper

The Science and Technology Agency recently published the FY-80 science and technology white paper entitled "International Comparisons and Future Issues." The main part of the white paper is the international comparisons, showing the world level attained by Japanese science and technology and how much we have progressed in the 35 years since World War II. At the same time it points out the weaknesses of Japanese science and technology and provides recommendations on what must be done to maintain this progress in the future. Recent white papers have been criticized for being overly complicated, so an effort has been made to make this one easier to understand by including plenty of charts and graphs. The agency praises itself on this account, stating: "We were able to write this white paper so that a junior high school student could understand it, without sacrificing the content."

GNP Also One-Tenth of World's

The white paper is made up of three parts: "Among the Countries of the World," "Trends in Science and Technology Activities," and "Government Policy in FY-80."

The first part compares and analyzes the power, potential, and special features of the present science and technology of the major advanced nations. It attempts to establish the position held by Japan and other countries in the world and introduces the policies and strategies to be used by the major advanced countries to promote science and technology in the future.

Japanese economic strength has increased dramatically since the war, and in terms of GNP, we now have one-tenth of the world total. But what about science and technology? The report takes research spending and the number of people involved in research as indicators of the investment in research and the exports of technology-intensive products as an indicator of scientific and technical performance. By these measures, it shows the comparative positions of six major advanced countries (Japan, the United States, Great Britain, France, West Germany, and the Soviet Union) in science and technology.

Throughout the 1970's, these six major advanced countries were responsible for 80 percent of the world total in research spending. This is much greater than the percentage of the world's GNP held by these countries. By this we see that the amount of spending by these six countries for science and technology is very large. Among these countries, Japan ranks third in research spending, with a little less than 10 percent of the world total.

These six countries have more than 70 percent of the world's research personnel. Since the six countries have only 20 percent of the world's population, we can see that people engaged in research are extraordinarily concentrated in these countries. Japan ranks third in this area as well, with over 10 percent of the world total.

It is only natural for a country which can apply the progress of science and technology to its manufacturing capability to become more competitive in exports of technology-intensive products such as chemical products and machinery and to increase its volume of exports. Not surprisingly, the six major advanced nations account for 60 percent of the world total in exports of technology-intensive products. The percentage of technology-intensive products in total exports is particularly great for West Germany and the United States. Japan does not have 10 percent of all exports in the world, but its share of technology-intensive exports alone is greater than 10 percent.

Therefore, in both investment and performance, Japan has passed the 10-percent mark in world science and technology. It has become a "10-percent nation" in terms of science and technology.

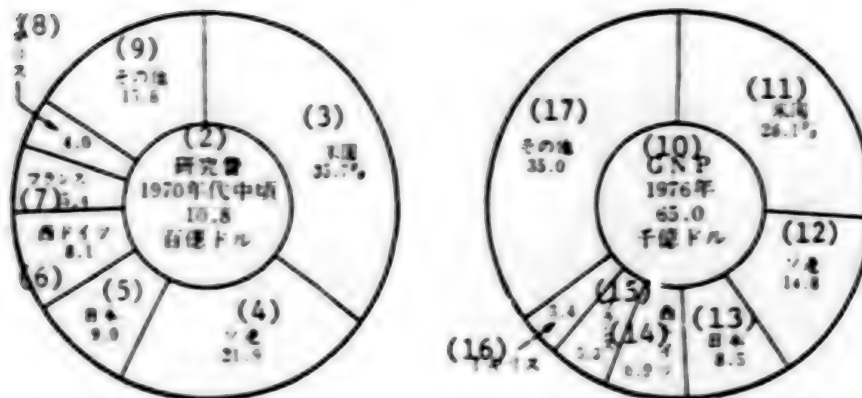
What is Japan's position among the advanced countries? The level of our science and technology is said to be on a par with that of the advanced countries of Europe and America. However, just as before, Japan is behind in fields of advanced science and technology which lead the world, and it lacks in capability for autonomous development.

The United States Is Tops in Technology Development Capability

Eight indicators of a country's technical and economic strength are used to compare the overall strength of Japanese science and technology with that of the major advanced countries. These are: 1) number of registered patents; 2) technology trade balance; 3) exports of technology-intensive products; 4) total added value of manufactured products; 5) research spending; 6) number of researchers; 7) number of patents registered in foreign countries; and 8) technology exports. These eight indexes were shown in graph form for five countries--Japan, the United States, West Germany, France, and Great Britain--with the total of the indexes for the five countries set at 100 so the features of each country's technology can be read in terms of size. According to this comparison, there is a great difference between the United States and the other four countries. In only one area--exports of technology-intensive products--is West Germany ahead of the United States.

However, it is clear that Japan, West Germany, and France are steadily gaining strength, and among these countries, the growth of Japan is particularly dramatic.

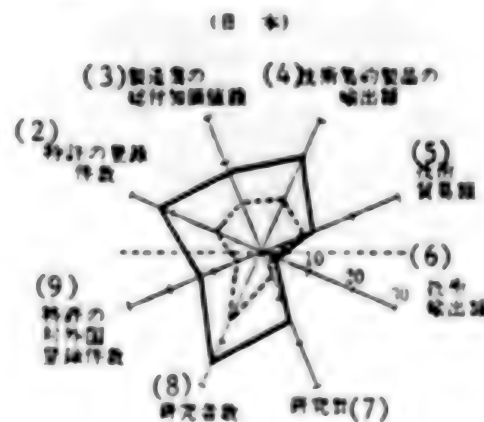
(1) 研究費とGNP (1970年代中ごろ)



(Key)

- | | |
|--|--|
| (1) Research Spending and GNP (throughout the 1970's) | (9) Other countries 15.8 percent |
| (2) Research spending throughout 1970's: 108 billion dollars | (10) GNP in 1976: 6.5 trillion dollars |
| (3) United States 35.7 percent | (11) United States 26.1 percent |
| (4) Soviet Union 21.9 percent | (12) Soviet Union 14.8 percent |
| (5) Japan 9.0 percent | (13) Japan 8.5 percent |
| (6) West Germany 8.1 percent | (14) West Germany 6.9 percent |
| (7) France 5.4 percent | (15) France 5.3 percent |
| (8) Great Britain 4.0 percent | (16) Great Britain 3.4 percent |
| | (17) Other countries 35.0 percent |

(1) わが国の科学技術総合力



(Key)

- | |
|---|
| (1) Overall Strength of Japanese Science and Technology |
| (2) Number of registered patents |
| (3) Total amount of added value in manufacturing industry |
| (4) Exports of technology-intensive products |
| (5) Amount of technology trade |
| (6) Technology exports |
| (7) Research spending |
| (8) Number of researchers |
| (9) Number of patents registered in foreign countries |

It appears that the United States is dropping back relative to the advance of Japan, West Germany, and France. Britain is either standing still or losing ground.

Development Funds Still Come Mainly From the Private Sector

The upper half of the graph shows the amount of technological strength and the lower half shows the amount of development capability. Japan has a large head and a small tail here. America is strong in the lower half, and this strength in the lower body gives it stability. Although Japan and West Germany are catching up with the United States in technological strength, we are still far behind in technological development capability.

The next item is the investment of funds and manpower, the motive force for progress in science and technology. In 1977, Japan was third in the world, behind the United States and the Soviet Union, in research spending. However, the ratio of national income was low when compared with Great Britain and West Germany. Also, the percentage of research expenditures borne by the government is low in comparison with the major advanced countries. Funding for research and development centers on the private sector.

In number of researchers, Japan is on about the same level per capita as the United States and much greater than the European countries. With respect to the field of specialty of scientific researchers, the percentage of people in the natural sciences, and particularly in engineering, is very great, providing support for our industrial science and technology.

In results of science and technology, as seen in exports of technology-intensive products, Japan ranks third, after the United States and West Germany. Japan is top in the world in electrical equipment, transportation equipment, and precision equipment. However, in technology trade, Japan and West Germany show a deficit, while the United States and France have a surplus. In terms of new contracts, Japan has been in the black since 1972.

Thus, Japan has developed the strength in science and technology to catch up with or surpass other advanced nations, and its influence in the world has grown to that extent. Certainly, Japan has a great technological capability, but it is still weak in development capability, especially in world-leading advanced technology. This is not the first time this has been pointed out. It has been repeated for the last 10 years. What we do to improve in this area will be the key to our future role as an advanced nation.

9651

CSO: 4106/4

SCIENCE AND TECHNOLOGY

FY-82 BUDGET ESTIMATE FOR SCIENCE, TECHNOLOGY GIVEN

Tokyo KAGAKU SHIMBUN in Japanese 11 Sep 81 p 1

[Text] FY-82 Science and Technology Budget; Government Budget, Estimated Requests Decided

The estimated government budget requests for FY-82 were submitted by all ministries and agencies to the Ministry of Finance on 31 August. Since 1982 is the first year of administrative and financial reform, the slogan for the budget is "zero ceiling." New requests are quite small and there are very few which exceed the previous year's budget by more than 10 percent. In science and technology related budgets, the 6.1-percent increase in the Ministry of Education's scientific research expense subsidy and increased requests for research and development expenses for new energy sources such as nuclear fusion stand out. The estimated budget requests for the Ministry of Education, the Science and Technology Agency, and MITI are given below.

Ministry of Education: Scientific Research Expenses Up 6.1 Percent; 5.5 Billion Yen to the Tristan Program

The Ministry of Education is placing importance on expanding scientific research spending, promoting research in nuclear fusion, and improving accelerator science. It has requested a scientific research expense subsidy of 38 billion yen, an increase of 6.1 percent, and set up new special promotion research programs. It is proceeding on schedule with the fiscal year construction plans for plasma laboratories at Tohoku University and Tsukuba University and experimental equipment for Kyoto University and Osaka University. In accelerator science, the High Energy Physics Laboratory's Tristan Program is entering its second year, and a budget of 5.582 billion yen was requested.

An expansion of scientific research expenses was requested because of the technical and social importance of the scientific research expense subsidy. Because of new special promotion research programs (1 billion yen) and other programs, a request was made for 38 billion yen, an increase of 2.2 billion yen (6.1 percent) over the previous year.

This includes the following: 1) 1 billion yen for special promotion research programs (new): selective promotion of research subjects with potential for achieving superior results in research which leads the world--for example, research on optoelectronic IC's and splitting of the cells of microorganisms;

2) 2.834 billion yen (304-million-yen increase) for promotion of joint research (experimental research) with private sector researchers: greater promotion of joint research in universities; 3) 2.98 billion yen (750-million-yen increase) for training of researchers with potential (encouragement research A); 4) 1.056 billion yen (146-million-yen increase) for promotion of overseas technical research and survey activities (overseas technical surveys); 5) 30.13 billion yen (same as last year) for superior research programs (special research, specific research).

The nuclear fusion research budget includes: 1) 1.098 billion yen (487 million yen last year) for experimental equipment with ultra-conductive material for nuclear fusion in the Tohoku University Metals Research Laboratory; 2) 2.162 billion yen (2.075 billion yen last year) for composite mirror experimental equipment for the Tohoku University Plasma Research Center; 3) 1.541 billion yen (1.172 billion yen last year) for nuclear fusion reaction plasma production experimental equipment; 4) 1.1 billion yen for heliotron F equipment for the Kyoto University Heliotron Nuclear Fusion Research Center; and 5) 2.835 billion yen (2.923 billion yen last year) for Gekko VII laser equipment for the Osaka University Laser Nuclear Fusion Research Center.

The new energy and energy conservation research budget includes: 1) 302 million yen (325 million yen last year) for closed-cycle MHD electricity-generating experimental equipment for the general science and engineering department of Tokyo Institute of Technology, and 2) 310 million yen (240 million yen last year) for heavy radiation damage study equipment for the Atomic Energy Joint Research Center of Tokyo University.

The accelerator science budget includes: 1) 997 million yen (2.875 billion yen last year) for radiation light experimental facilities, and 2) 5.582 billion yen (499 million yen last year) for the Tristan Program, both in the High Energy Physics Laboratory.

The space science budget is 504 million yen (1.465 billion yen last year) for a large radio telescope for the Nobeyama Universe Radio Wave Observation Center of Tokyo University's Tokyo Observatory.

The marine science budget includes 933 million yen (781 million yen last year) for construction of the research ship "Ensei Maru" (460 tons) for the Tokyo University Marine Research Laboratory.

The establishment of new academic departments includes a civil engineering section (40 people) in the engineering department of Utsunomiya University, an electronic machinery engineering section (25 people) in the engineering department of Nagoya University, and a construction engineering department (40 people) in the science and engineering department of Saga University.

2.2 Billion Yen for "Creative Science and Technology"; Expansion of Promotion Coordinating Expenses for the Science and Technology Agency

The Science and Technology Agency budget request includes 316.332 billion yen in General Accounts and 68.429 billion yen in the Power Plant Development Maintenance

and Development Measures Special Account, for a total of 384.761 billion yen for the entire agency. This is an increase of 4.5 percent over the 368.270 billion yen for the previous year (FY-81).

The most conspicuous features of next year's budget are: 4 billion yen for expanding the Science and Technology Promotion Coordinating Expenses, 2.25 billion yen for promoting creative science and technology by means of a flexible research system, and 5.01 billion yen for promoting and preparing for international science and technology exhibitions. The categories in the Special Accounts estimated budget request are given below.

Promotion of Marine Development: 5.511 billion yen, which includes 1.473 billion yen for research with a deep-sea underwater research vessel, 35 million yen for marine energy research and development, 116 million yen for research and development of sea zone control technology and a new ocean observation system, and 125 million yen for Black Current development and use research.

Promotion of Disaster Science and Technology: 2.44 billion yen, including 1.219 billion yen for earthquake prediction research; 1) 2.373 billion yen for the National Disaster Science and Technology Center including 1.173 billion yen for earthquake prediction, 190.07 million yen for earthquake countermeasures, 120.05 million yen for snow damage countermeasures. [figures as published]

Promotion of Major Joint Research: 25.385 billion yen. 1) 1.172 billion yen for promotion of life science including 606 million yen for construction of gene recombination research facilities; 2) 9.433 billion yen for aeronautic technology research and development at the Aerospace Technology Laboratory including 6.239 billion yen for research and development of the fan jet STOL experimental aircraft; 3) 6.75 billion yen for the Institute of Physical and Chemical Research including 340 million yen for laser scientific and technical research; 4) 5.539 billion yen for materials technology research and development, e.g., ultimate materials; and 5) 381 million yen for joint use measures for resources.

Preparing Foundation for Science and Technology Promotion: 5.155 billion yen. 1) 445 million yen for reinforcing the foundations of research and development, e.g., by preparing basic science and technology plans; and 2) 4.41 billion yen for promoting distribution of science and technology information.

Expansion of Science and Technology Promotion Coordinating Expenses: 4 billion yen. **Promotion of Creative Science and Technology Through Flexible Research System:** 2.25 billion yen. **Promotion and Preparation of International Science and Technology Exhibitions:** 5.01 billion yen--1.915 billion yen for carrying out activities related to government exhibits and 3.049 billion yen for assistance to activities of the International Science and Technology Exhibition Association. **Promotion of International Cooperation:** 11.072 billion yen--10.762 billion yen for promoting cooperation with the advanced countries, 90 million yen for promoting cooperation with the developing countries, and 220 million yen for promoting cooperation with international organizations.

MITI Doubling Budget for "Next-Generation Technology"; Manganese Nodule Mining and High Speed Computer System

The total MITI budget request from General Accounts for FY-82 is 799.371 billion yen. This is an 11-percent increase over last year's budget of 719.338 billion yen.

A conspicuous feature is the request of 4.812 billion yen for next-generation basic industrial technology development, about twice the figure for the previous year. The requests for manganese nodule mining, 883 million yen, and for a scientific and technical high-speed computer system, 815 million yen, are also greatly increased over last year. A general-use Stirling engine program under the Moonlight Plan is a new project for which 40 million yen was requested. Large-scale projects include an automatic sewing project at 50 million yen and promotion of space industries at 66 million yen.

Development of Industrial Policies To Create Vitality and Promotion of Technological Development: 108.857 billion yen. Securing the Foundations for Development of Technologically Advanced Industries: 16.35 billion yen. 1) 8.977 billion yen for promotion of information industries--5.66 billion yen for promoting development of basic technology for next-generation (fourth generation) electronic computers, 509 million yen for research and development of basic technology for electronic computers (fifth generation); 2) 7.307 billion yen for promoting the aircraft industry--1.502 billion yen for developing a commercial cargo aircraft (YXX), 5.402 billion yen for developing a jet engine (XJB) for use in commercial aircraft; 3) 66 million yen for promoting the space industry--30 million yen for research and development of technology for remote detection of resources, 30 million yen for study trends in high-technology-intensive machinery industries.

Promotion of Technological Development: 84.915 billion yen. 1) 4.812 billion yen for promotion of next-generation basic industrial technology development, 6.25 billion yen for new energy technology research and development (Sunshine Plan)--2.129 billion yen for solar energy, 1.506 billion yen for geothermal energy, 752 million yen for coal energy, 396 million yen for hydrogen energy, and 664 million yen for joint research.

2) 3.124 billion yen for research and development in energy conservation technology (Moonlight Plan)--602 million yen for magnetic hydrodynamics (MHD) electricity generation, 900 million yen for a high-efficiency gas turbine, 252 million yen for a new battery charge storage system, 253 million yen for fuel cell electricity generation technology, 40 million yen for a general-use Stirling engine program, 198 million yen for advanced basic energy conservation technology, 720 million yen for assistance in energy conservation technology development.

3) 17.048 billion yen for promotion of large-scale engineering technology development (large-scale projects)--735 million yen for resource recycling and utilization technology systems, 3.784 billion yen for composite production systems using ultra-high performance lasers, 3.254 billion yen for measurement control systems using optoelectronics, 2.541 billion yen for production methods for basic chemicals using nitrogen monoxide, 104 million yen for ocean floor petroleum production systems, 883 million yen for manganese nodule mining systems, 815 million yen for a high-speed computer system with scientific and technical applications, and 50 million yen for an automatic sewing system.

4) Promotion of private sector technology development--2.349 billion yen for major technology research and development.

5) Promotion of international research cooperation--7 million yen for U.S.-Japan scientific and technical cooperation.

Preparation of a System for Stable Supply of Resources: 6.255 billion yen--
814 million yen for wide-ranging geological structure surveys, 971 million yen
for precision geological structure surveys, 1.402 billion yen for new mineral
deposit exploration, 1.475 billion yen for surveys of mineral resources on the
ocean floor in deep water and surveys of exploration technology development,
612 million yen for operations of the Promoting Agency for Metallic Minerals
Prospecting, 768 million yen for basic surveys of overseas mineral resources,
etc.

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CSO: 4106/5

CURRENT TRENDS OF TECHNICAL COOPERATION DISCUSSED

Tokyo DIGEST OF JAPANESE INDUSTRY, TECHNOLOGY in English No 163, 1981 pp 5-8

[Article by Kaoru Honjo, Technical Cooperation Div., International Trade Policy Bureau, MITI]

[Text]

Japan's Technical Cooperation Policy

Basic Policy

There has been growing importance of technical cooperation on the so-called soft side assistance for Socio-economic developments in developing countries. Technical cooperation covers (1) "talent training cooperation" by providing assistance to capable personnel who will shoulder future development of the country, (2) energy-related technical assistance to cope with the world energy shortage, and (3) the strong need for technical cooperation toward medium and small enterprises of the developing countries.

From this viewpoint, it is necessary to expand technical cooperation in these three fields by positively utilizing the abundant technical knowledge, experience, management knowhow, etc., accumulated by private Japanese businesses.

At the same time, it is necessary to provide suitable aid which conforms with the actual needs of the recipient country as the development stages of developing countries are diverse. Therefore, it is necessary to accurately grasp the most appropriate form of technical cooperation according to the real needs of each country.

Present Situation

In 1979, Japan provided a total of \$241.9 million in technical cooperation to developing countries which was a 9.4 per cent increase over the preceding year (see the Table). The figure represents a remarkable two-fold increase in comparison with the 1976 total of \$108.1 million.

However, the level of Japan's technical cooperation amount is still low when compared with the figures of

other advanced countries. It is about one-seventh of France and about one-third of West Germany. It is desired that Japan will further expand its technical cooperation program in the future because the GNP ratio is also low.

A breakdown of the amount of Japanese technical cooperation shows that trainees and students studying in this country totaled \$55.41 million (ratio was 22.9% of the technical cooperation total involving 9,197 persons), dispatch of specialists was \$108.56 million (44.9% ratio and 6,673 persons), providing machinery \$24.01 million (9.9% ratio) and research cooperation amounted to \$8.65 million (3.3% ratio).

By region, Asia received 50 per cent of the technical cooperation followed by Latin America with 18.4 per cent, Africa with 15.7 per cent and the Middle East with 4.1 per cent. The figures show that technical cooperation for Asia is far above those of other regions.

Basic Views on Japan's Technical Cooperation toward Middle East Countries

There are many oil-producing countries in the Middle East including Saudi Arabia, United Arab Emirates, Iraq, Kuwait, etc. It is important that Japan establishes close relations with these countries without limiting relations to the purchase of oil. It is necessary to positively promote economic and technical cooperation toward Middle East countries from this viewpoint.

Since oil-producing countries have abundant development funds, they are seeking promotion of technical cooperation in such fields as establishing economic and social development programs, dispatch of specialists and acceptance of trainees.



Technical Cooperation with Saudi Arabia

Technical Cooperation on Seawater Desalination

An informal request for joint research on desalination of seawater technology was made in November 1975 when Prince Faisal (Chairman of the Board of Directors, SWCC) visited Japan. After several consultations between the two sides, an administrative-level agreement was reached in March of this year.

The technical cooperation agreement calls for joint Japan-Saudi Arabia research to apply Japan's desalination technology by adopting it to domestic conditions in Saudi Arabia and putting the technology into practical use. Another key objective is to train Saudi Arabian personnel to carry out technical transfer in the desalination field to produce fresh water. The securing of fresh water is a very important task for Saudi Arabia and its neighboring countries in order to stabilize the livelihood of the people as well as promote industrial and agricultural development. Therefore, it is very important for Japan to cooperate in this field.

Saudi Arabia is attaching importance to talent training because it is promoting nation-building at present. This technical cooperation program is highly significant because it will lead to strengthening of Saudi Arabia's technical capabilities as well as the development of technicians to operate and manage the desalination plants.

Technical Cooperation on Concentrated Drainage Disposal

In 1979, Saudi Arabia's Ministry of Agriculture and Water asked Japan for cooperation in solving the problem of concentrated drainage disposal caused in the operation of fresh water plants under the reverse infiltration method in the Riyadh area waterworks.

The Japanese side responded by sending a survey team to study handling of the concentrated drainage disposal of the reverse osmosis process fresh water plants established at three water purification plants in Riyadh's Malez, Shemessy and Manfouha districts.

Cooperation for Standardization

Saudi Arabian promotional body for standardization represents the Saudi Arabian Standards Organization

(SASO) established in 1972. SASO has been set up to exercise such functions as standards stipulation and quality-guarantee marks, but at present it is not functioning fully.

In recent years, Saudi Arabia desires particular cooperation focusing on the standardization of electric appliances and the perfection of laboratories in compliance with the rapid diffusion of electric products.

In consequence, Japan has so far sent standardization specialists to Saudi Arabia and accepted trainees on several occasions.

Technical Cooperation toward the United Arab Emirates (UAE)

Technical cooperation for seawater desalination by solar energy.

This cooperation was requested by the Minister of Petroleum and Mineral Resources, Otaiba in July 1979 when the then MITI (Ministry of International Trade and Industry) Minister Esaki visited the UAE. It is aimed at carrying out a series of experimental projects on an accelerating basis under severe natural conditions in the Middle East area by establishing test plants. The objective is to put into early use seawater desalination technology through application of solar energy which is suitable to cope with small quantity water demands in isolated islands.

The principal Japanese agency handling the project will be the New Energy Development Organization.

This technical cooperation is an epoch-making project aimed at turning seawater into fresh water by means of solar energy.

In this sense, it will be an important project signifying friendly relationship between Japan and the UAE.

It is, therefore, hoped that the specific project will achieve successful research results at the earliest date and attain original objectives through the expected

Table Japan's Technical Cooperation

Year Items	1975		1976		1977	
	Amount (US\$ million)	Number of persons	Amount (US\$ million)	Number of persons	Amount (US\$ million)	Number of persons
1. Training program for overseas participants	22.43	6,700	26.61	6,353	35.38	6,862
Students	4.36	821	5.43	856	7.63	921
Trainees	18.07	5,879	21.18	5,497	27.75	5,941
2. Dispatch of specialists and volunteers	39.07	4,211	45.75	4,989	67.34	5,425
Specialists	34.97	3,499	41.06	4,260	61.48	4,637
Overseas cooperation volunteers	4.10	712	4.69	729	5.86	788
3. Providing machinery	7.62	-	12.30	-	14.79	-
4. Research cooperation	3.64	-	2.91	-	4.96	-
5. Others	14.41	-	20.54	-	25.37	-
Technical cooperation (A)	87.17	10,911	108.11	12,082	147.84	12,287
Official development assistance (B)	1,147.7	-	1,104.9	-	1,424.4	-
Ratio to official development assistance (A)/(B)	7.6%	-	9.8%	-	10.4%	-

Year Items	1978		1979	
	Amount (US\$ million)	Number of persons	Amount (US\$ million)	Number of persons
1. Training program for overseas participants	51.52	7,726	55.41	9,197
Students	11.15	985	12.41	1,270
Trainees	40.37	6,741	43.00	7,927
2. Dispatch of specialists and volunteers	98.57	6,610	108.56	6,673
Specialists	90.13	5,765	98.82	5,759
Overseas cooperation volunteers	8.44	845	9.74	914
3. Providing machinery	28.75	-	24.01	-
4. Research cooperation	7.82	-	8.65	-
5. Others	34.51	-	45.25	-
Technical cooperation (A)	221.17	14,336	241.88	15,870
Official development assistance (B)	2,215.4	-	2,637.5	-
Ratio to official development assistance (A)/(B)	10.0%	-	9.2%	-

development of related techniques as a result of mutual cooperation.

Acceptance of Trainees and Dispatch of Specialists

As of the end of 1980, Japan has dispatched 24 specialists from such fields as fishery, agriculture, TV broadcasting, etc. while accepting 31 trainees from the UAE who are specializing in TV broadcasting, electrical communication and civil engineering.

Desert Tree-planting Project

This project is aimed at afforestation of deserts to prevent salt damage (desalting) and to supply water for greening. It is a private technical cooperation project with the assistance of MITI.

The project was concluded in the 1980 fiscal year. The experimental farms are presently operated by the UAE Government.

Technical Cooperation toward Egypt's El Dikheila Steel Plant Program

In order to improve housing shortages caused by a rapid population increase by one million persons per year in Egypt, housing construction is considered as one of the most urgent tasks in the country.

Due to the fact that bar steel and other construction items are lacking which have led to increasing imports, the plan calls for the establishment of a steel plant to replace imports. The program also required the construction of an integrated steel plant under a direct reduction system in Dikheila district, west of Alexandria. It will produce bar steel and wire rod by utilizing domestic natural gas.

In January 1979, the Egyptian Government requested Japan to implement a feasibility study on this project. In response to the request, the Japanese Government carried out a feasibility study as part of its technical cooperation toward Egypt and submitted an F/S report based on the study in August of the same year.

Technical Cooperation toward Other Middle East Countries

Japan has been exercising technical cooperation toward the Middle East nations through development survey, project method techniques, acceptance of trainees and dispatch of specialists.

It is imperative for this country to positively promote similar technical cooperation in the future by taking heed of various needs of the Middle East nations. ■

CSO: 4120/62

JICA'S TECHNICAL COOPERATION REVIEWED

Tokyo DIGEST OF JAPANESE INDUSTRY, TECHNOLOGY in English No 163, 1981 pp 9-13

[Article by Kiyoshi Isaka, Planning Dept., Regional Study and Coordination Div., Japan International Cooperation Agency (JICA)]

[Text]

Japan's ODA Performances and Technical Cooperation toward Middle East

Japan's Official Development Assistance (ODA) amounted to \$3.3 billion in 1980. The figure represented a 25.3 per cent increase in comparison with the preceding year's total of \$2.64 billion. The 1980 total realized the ODA goal of doubling government aid in three years.

Last year's ODA total increased to 0.32 per cent of the GNP which showed an increase from the previous year's 0.26 per cent. In this manner, Japan's ODA showed a major expansion (See Table 1).

A look at the geographical distribution of the \$1.96 billion bilateral ODA for 1980 showed that Asia was the largest with 70.5 per cent (35.9 per cent of the amount was distributed among ASEAN). Asia was followed by Africa with 11.4 per cent, the Middle East with 10.4 per cent and Latin America with 6.0 per cent.

Technical cooperation is classified as grants in the above-mentioned ODA. This country's 1980 technical cooperation amount was \$277.8 million which was a 14.8 per cent increase over the preceding year's \$241.9 million.

Of the technical cooperation total in 1980, the assistance provided by the Japan International Cooperation Agency (JICA) amounted to \$197 million or 70.9 per cent of the total. JICA occupied the top position in Japan's technical cooperation field.

JICA's Technical Cooperation toward Middle East

As a government-based agency providing technical cooperation, JICA carries out various programs such as training programs, expert assignment programs, project-type technical cooperation, development survey programs,

the Japan Overseas Cooperation Volunteers Program, etc.

From April 1954 to March 1980, JICA's technical cooperation toward the Middle East totaled 22.1 billion yen. The figure represents 10.6 per cent of the total aid share.

A breakdown of the total by programs showed that the training program was the largest with 5.6 billion yen (25.2%) followed by development survey 5.2 billion yen (23.4%), project-type technical cooperation 5.1 billion yen (23.1%) and expert assignment program 4.1 billion yen (18.7%).

Technical cooperation with the Middle East is carried out under the key JICA programs (see Table 2). JICA's main technical cooperation recipients in the Middle East are Egypt, Iran, Turkey and Iraq.

The following results were achieved in JICA's various programs in fiscal 1980:

- (1) Training program: Number of trainees accepted 484 (12.4% share)
- (2) Expert assignment program: Number of experts sent - 248 (10.2% share) (note 2)
- (3) Development survey program: Number of survey personnel sent - 203 (8.1% share)
- (4) Project-type technical cooperation: Ten projects (on going projects as of July 1981)
- (5) Japan Overseas Cooperation Volunteers Program: Number of Volunteers dispatched - 111 (10% share) (note 3).

A study of the substance of the above-mentioned JICA performances indicates that most of the trainees were accepted in the field of heavy industry, telecommunications, development planning and agriculture-forestry-fishery.

In the second expert assignment program, the majority of experts were sent to the construction-engineering

field, agriculture-forestry-fishery and the medical-welfare field.

Surveys of 18 projects were conducted in the development survey program. They covered following areas;

Transportation and telecommunications sector

EGYPT

Expansion project of Suez Canal (second stage) and telephone network improvement project in Alexandria

Construction sector

JORDAN

Ring road construction plan in Irbid, Jordan

Agriculture sector

EGYPT

South Hosainia Valley agricultural development project

OMAN

Agricultural development project for Batinah area

Fishery sector

SUDAN

Improvement project of fish supply marketing system

UNITED ARAB EMIRATES

Manculture center construction project

Public Sector

UNITED ARAB EMIRATES

Water resources development project



Crew Training Boat,
Tunisia National Fisheries Center.

Technical cooperation also covers the manufacturing and mining department and other fields.

The fourth project-type technical cooperation program involves the carrying out of long-term technical cooperation. The following projects are being implemented at present

Future Trend of Technical Cooperation toward the Middle East Area

Japan has maintained a close relationship with the Middle East oil-producing countries in terms of the oil-importing business while JICA has been exercising a wide range of technical cooperation not only toward these oil-producing nations but other non oil-producers.

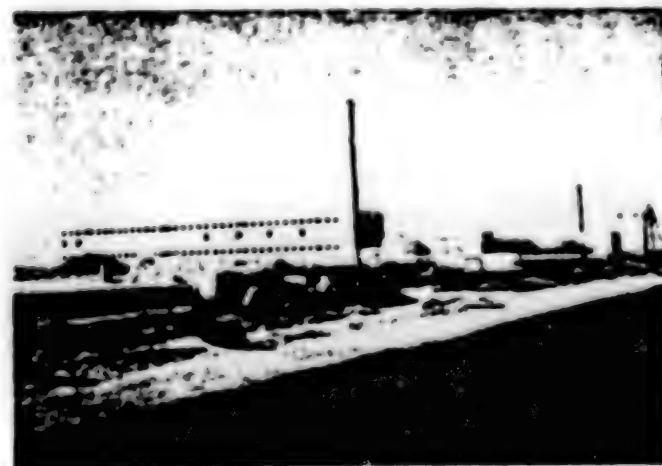
On the other hand, the Middle East countries, whether oil-producing or not, presently need the induction of technology for their economic and social development. Particularly, technical cooperation toward the oil-producing countries is now under study in terms of the implementation of onerous technical cooperation in addition to the hitherto gratuitous type since those nations possessing a great amount of the so-called oil dollars show a high ratio of GNP per head.

In some of the Middle East countries, foreigners are involved in their administrative organizations and government agencies in an effort to carry out technical cooperation.

It appears essential to proceed with technical cooperation by taking into due consideration technical transfer to the counterparts of the said nations in order to assist those countries to educate talent required for nation-building.

In addition, it will become a great task for us to recruit Middle East specialists in Japan in an attempt to meet requirements of cooperation from the Middle East nations because Japan is quite different from them in terms of climate, manners and customs, etc.

Technical cooperation being implemented by JICA has proven to be an instrumental measure to strengthen relationship between Japan and the Middle East countries. It is desired, therefore, that Japanese technical cooperation toward these nations will be expanded and mutual understanding will be deepened. ■



Tunisia National Fisheries Center

Project-Type Technical Cooperation toward Middle East Countries

Country	Project	R&D duration	Outline
Algeria	Medical Center at University of Science and Technology of Oran	April 1978 through March 1983	To improve diagnostic and treatment techniques in such fields as ophthalmology, hematology, oncosis and genetics on the occasion of the establishment of a medical center.
Egypt	Arab Maritime Transport Academy	November 1976 through November 1980 and extended to May 1982	To provide cooperation to the Arab League nations in enhancing maritime transportation with their own ships by training crews who are essential for the development of the maritime transportation industry.
	Shaubra machinery Maintenance Training Center	January 1977 through January 1982	To foster maintenance, administration and repair techniques for machinery and equipment necessary for the reconstruction of the Arab Republic of Egypt.
	Nursing Education and Research	April 1978 through March 1983	To set up educational programs for a short-term nurse leader special training course, to establish a new teaching method adopting audio-visual educational techniques and to bring up nursing leaders on the basis of the Egyptian nurse education program.
	Textile Research and Development	November 1980 through November 1985	To help upgrade production technology of spinning, fabric and knitting, establish and operate a pilot plant and educate mainstay engineers in an effort to enlarge the textile sector of the National Research Inst. and improve its R&D ability.
Iraq	Electric & Electronic Industries Training Center	September 1975 through July 1981	To train experienced technicians to engage in repair service and to engage in maintenance of elevators, air conditioners, cooling equipment and other electronic apparatus.
Jordan	Electronics Service Center, Royal Scientific Academy	December 1977 through December 1981	To provide cooperative service in maintaining and testing electronic measurements in the electric communication field in order to contribute to improvement of the electronics engineering application sector.
Saudi Arabia	The Riyadh Electronics Technical High School	June 1974 through school opening	To train high-level engineers for the future electronics industry.
Tunisia	National Fisheries Center	July 1978 through June 1981 and extended to December 1982	To improve technical quality of fisheries and reeducate instructors by establishing the National Fisheries Institute.
	Drug Quality Control	April 1980 through March 1982	To upgrade the quality of medicines through technical cooperation in such fields as the chemical analysis, apparatus analysis and bacteriological testing of medicines.

Table 1. Japan's Economic and Technical Cooperation

Item \ Year		1979	Composition ratio (%)	1980	Growth rate (%)	Composition ratio (%)
Official development assistance	Grants	560.2	21.2	652.6	16.5	19.8
	Financial grants	316.3	12.0	374.8	17.8	11.4
	Technical assistance	241.9	9.2	277.8	14.8	8.4
	(JICA)	(159.8)	(6.1)	(197.0)	(23.3)	(6.0)
	Loans	1,361.0	51.6	1,308.2	-3.9	39.6
	Total	1,921.2	72.8	1,960.8	2.1	59.4
	Capital participations in international organs	716.3	27.2	1,342.9	87.5	40.6
	Grand total	2,637.5	100	3,303.7	25.3	100.0
	Comparison with the previous year (%)	19.1		25.3		
	Ratio to GNP (%)	0.26		0.32		

(Note 1)

Following is a gist of varied programs being exercised by JICA:

Trainees acceptance project

In response to the requests of the developing countries, JICA accepts engineer trainees from those nations for technical education, increasing new knowledge and retraining, thus contributing to the partner countries' economic and social development and to promotion of mutual friendship.

Export assignment program

JICA dispatches a number of specialists and engineers to the developing countries who practice planning, technical education development programs and researches at the government agencies and experimental study organizations in partner countries.

Development survey program

JICA conducts consulting cooperation by dispatching a survey mission in an effort to carry out public development programs for the basic industries which play an important role in the economic growth of the developing countries.

For instance, they include road construction, port-facility construction, communication network establishment and electric power development.

Project type technical cooperation

JICA provides cooperation toward vocational training projects, agricultural development projects and medical cooperation projects in an integrated cooperation method which covers a combination of various forms of cooperation and an overall cooperation system ranging from planning to implementation of technical cooperation programs.

Japan Overseas Cooperation Volunteers program

In response to the cooperation requirements of the developing nations, JICA sends Japanese youth volunteers to those countries in an attempt to contribute to their economic and social development by having the youths live together with the local people in host countries.

(Note 2)

The number of dispatched specialists includes those under the project-type technical cooperation plan.

(Note 3)

Japanese cooperation volunteer corps are dispatched to three countries in the Middle East area such as Morocco, Tunisia and Syria.

Table 2. Technical Cooperation Expenses by Program and Region (1954-1980)

(Unit: Billion yen)

Region	Overseas Participants	Experts Dispatch	Development Survey	Technical Cooperation	Japan Overseas Cooperation Volunteers	Others	Total
Asia	19.0	14.8	27.2	39.2	6.9	4.1	111.2
Middle East	5.6	4.1	5.2	5.1	1.5	0.6	22.1
Africa	2.8	5.1	7.1	5.0	6.0	1.0	27.0
Latin America	7.5	7.0	9.5	7.6	1.1	2.0	34.7
Others	1.9	3.5	1.5	0.7	5.8	0.5	13.9
Total	36.8	34.5	50.5	57.6	21.3	8.2	208.9

GOVERNMENT DECIDES ON BASIC ENERGY ACTIONS

Tokyo JAPAN PETROLEUM & ENERGY WEEKLY in English Vol 16 No 39, 28 Sep 81 pp 1-4

[Text]

On September 22, the government held a Ministerial Council Meeting for the Promotion of Overall Energy Policy Measures, at which the nation's basic energy actions were decided, with special emphasis placed on the following:

- The government will buy up 2.4 million kiloliters (15.1 million barrels) of crude oil from private refiners by the end of this year to build up the government-owned oil stockpiles (owned by the governmental Japan National Oil Corp.), taking advantage of the current world oil glut and concurrently relieving refiners of the financial burden arising from lifting crude oil in excess of their refinery processing needs, as obligated under existing crude oil purchase contracts. The government has already purchased up to 1.1 million kiloliters (6.9 million barrels) from refiners since the beginning of fiscal 1981 (April 1, 1981). This means that government-owned oil stockpiles will increase by 3.5 million kiloliters (22.0 million barrels) to approximately 11 million kiloliters (69.2 million barrels) during the current fiscal year. This corresponds to 17.6 days' supply, based on the net daily oil imports of 3,933 thousand barrels for domestic fuel product consumption during calendar 1980. (Related article on page 10.)
- To speed up the expansion of nuclear power plant capacity, steps will be taken to simplify the procedures to obtain government approval of applications for siting new nuclear power plants, thereby shortening the total period required for completion of these plants, currently 15 years, by an average of 2 years.
- The government has designated three additional areas for siting large-scale electric power generating facilities, as follows:
 - . Shimokita, Aomori Prefecture, for constructing a 1,100-MW nuclear

power plant to be placed onstream in June 1990 by Tohoku Electric Power Co.

- . Reihoku, Kumamoto Prefecture, for constructing two units (with a power generating capacity of 700 MW each) of coal-burning thermal power plants to be placed onstream in October 1988 and October 1989, respectively, by Kyushu Electric Power Co.
- . Higashi-Niigata, Niigata Prefecture, for constructing a 1,090-MW LNG-burning thermal power plant to be placed onstream in September 1984 by Tohoku Electric Power Co.

Of the foregoing three projects, the start of construction work of thermal power plants at Reihoku and Higashi-Niigata was approved at the Electric Power Development Coordination Council meeting held on June 30 of this year (JPEW, July 13 - p.8), while that of the nuclear power plant at Shimokita is expected to be approved at a Council meeting to be held next year.

Concurrent with the designation of the foregoing three additional areas, two areas where thermal power plants went onstream recently -- a 700-MW oil-burning thermal power plant at Date, Hokkaido, and a 1,400-MW oil-burning thermal power plant at Atsumi, Aichi Prefecture -- have been deleted from the list of designated areas.

After these additions and deletions, there are at present a total of 29 areas designated by the government for electric power plant siting with a combined capacity of 39,067 MW -- 13 areas for nuclear power plants with a combined capacity of 18,172 MW, 7 areas for coal-burning thermal power plants (10,000 MW), 3 areas for LNG-burning thermal power plants (4,490 MW), 5 areas for oil-burning thermal power plants (5,125 MW), and one area for a hydropower plant (1,280 MW).

The government first introduced this system of designating specific areas for siting large-scale electric power generating facilities on June 7, 1977, when the Ministerial Council for the Promotion of Overall Energy Policy Measures held its meeting. MITI is planning to request the Ministry of Finance for the first time to approve a budget appropriation totaling ¥1,500 million (\$6.5 million) for fiscal 1982 (beginning April 1, 1982) as government subsidies to be granted to local governments to encourage the cooperation of residents in the designated areas with power plant construction projects.

Listed on pages 3 and 4 as supplements are the 29 areas designated by the government for large-scale electric power plant construction projects, as they were published by MITI on September 22, 1981.

(Please note that the list includes power plant projects, construction of which have yet to be approved by the Electric Power Development Coordination Council, and hence it is believed to be of interest to our readers, as it shows a long-range plan for electric power plant capacity expansion on a plant-by-plant basis. - Editor)

GOVERNMENT DESIGNATED AREAS FOR LARGE SCALE ELECTRIC POWER PLANT CONSTRUCTION PROJECTS

(As of September 27, 1981)

AREA	ELECTRIC POWER COMPANY	PLANT CAPACITY, MW	CONSTRUCTION STARTED	DATE CONSTRUCTION	DATE OF DESIGNATION
Nuclear Power Plants (13 Areas)					
Kyowa-Tomari, Hokkaido	Hokkaido Electric Power Co.	#1 579 #2 579	September 1981	September 1988 February 1989	January 23, 1978
Shimokita, Aomori Pref.	Tohoku Electric Power Co.	#1 1,100	July 1982	June 1990	September 27, 1981
Onagawa, Miyagi Pref.	Tohoku Electric Power Co.	#1 524	December 1979	June 1984	June 7, 1977
Hamie-Otake, Fukushima Pref.	Tohoku Electric Power Co.	#1 875	January 1985	November 1989	June 7, 1977
Maki, Niigata Pref.	Tohoku Electric Power Co.	#1 825	August 1982	August 1989	June 15, 1979
Kashiwazaki-Kariwa, Niigata Pref.	Tohoku Electric Power Co.	#1 1,100 #2 1,100 #3 1,100	December 1978 May 1982	October 1985 April 1989 October 1989	June 7, 1977
Ashihama, Mie Pref.	Chubu Electric Power Co.	#1 1,100 #2 1,100	(Announcement withheld)		June 7, 1977
Mito, Ithikawa Pref.	Hokuriku Electric Power Co.	#1 540	September 1985	March 1990	June 7, 1977
Tsuruga, Fukui Pref.	Japan Atomic Power Co.	#2 1,160	June 1981	March 1986	June 7, 1977
Takahama, Fukui Pref.	Kansai Electric Power Co.	#3 870 #4 870	December 1980	February 1985 August 1985	January 23, 1978
Shimane, Shimane Pref.	Chugoku Electric Power Co.	#2 820	June 1983	September 1988	June 7, 1977
Toyokita, Yamaguchi Pref.	Chugoku Electric Power Co.	#1 1,100 #2 1,100	November 1986	November 1991 November 1993	January 23, 1978
Sendai, Kagoshima Pref.	Kyushu Electric Power Co.	#1 900 #2 900	January 1979 May 1981	July 1984 March 1986	June 7, 1977
Coal-Burning Thermal Power Plants (7 Areas)					
Tomato-Azuma, Hokkaido	Hokkaido Electric Power Co.	#2 600	September 1981	September 1984	October 24, 1980
Mushiro, Akita Pref.	Tohoku Electric Power Co.	#1 600 #2 600 #3 600	July 1984 December 1987 December 1988	July 1987 December 1990 December 1991	June 15, 1979
Takahara, Hiroshima Pref.	Electric Power Development Co.	#3 700	May 1980	March 1983	June 7, 1977
Suyama, Hiroshima Pref.	Chugoku Electric Power Co.	#1 700	February 1986	January 1989	June 7, 1977
Mitsumi, Shimane Pref.	Chugoku Electric Power Co.	#1 700 #2 700	August 1986 May 1987	July 1989 April 1990	October 24, 1980

- Continued on next page -

GOVERNMENT DESIGNATED AREAS FOR LARGE-SCALE ELECTRIC POWER PLANT CONSTRUCTION PROJECTS (continued)

(As of September 22, 1981)

AREA	ELECTRIC POWER COMPANY	PLANT CAPACITY, MW	CONSTRUCTION STARTED	DATE ONSTREAM	DATE OF DESIGNATION
<u>Coal-Burning Thermal Power Plants (cont'd)</u>					
Matsuyama, Nagasaki Pref.	Kyushu Electric Power Co.	#1 700 #2 700	October 1982 October 1987	October 1985 October 1991	January 23, 1978
	Electric Power Development Co.	#1 1,000 #2 1,000	November 1982 July 1987	July 1986 March 1991	
Beihoku, Kumamoto Pref.	Kyushu Electric Power Co.	#1 700 #2 700	October 1985	October 1988 October 1989	September 22, 1981
<u>LHC-Burning Thermal Power Plants (3 Areas)</u>					
Higashi-Niigata, Niigata Pref.	Tohoku Electric Power Co.	#3 1,090	December 1981	September 1984	September 22, 1981
Futtsu, Chiba Pref.	Tokyo Electric Power Co.	#1 1,000 #2 1,000	September 1982	September 1985 December 1985	January 23, 1978
Yanai, Yamaguchi Pref.	Chugoku Electric Power Co.	#1 700 #2 700	September 1984 September 1985	April 1987 April 1988	October 24, 1980
<u>Oil-Burning Thermal Power Plants (5 Areas)</u>					
Manao, Ishikawa Pref.	Hokuriku Electric Power Co.	#1 500	January 1983	March 1986	June 7, 1977
Aioi, Hyogo Pref.	Kansai Electric Power Co.	#1 375 #2 375 #3 375	November 1979	September 1982 November 1982 December 1982	June 7, 1977
Gobo, Wakayama Pref.	Kansai Electric Power Co.	#1 600 #2 600 #3 600	April 1980	June 1984 August 1984 December 1984	January 23, 1978
Iwakuni, Yamaguchi Pref.	Chugoku Electric Power Co.	#3 500	April 1979	September 1981	January 23, 1978
(Announcement withheld)		600 600			June 15, 1979
<u>Hydropower Plant (1 Area)</u>					
Okawachi, Hyogo Pref.	Kansai Electric Power Co.	1,260	January 1983	April 1988 June 1988 April 1989 June 1989	January 23, 1978
TOTAL (29 Areas)		29,067			

(Source: Natural Resources & Energy Agency, MITI)

SCIENCE AND TECHNOLOGY

ELECTRIC UTILITY TO START COM BURNING IN POWER PLANTS

Tokyo JAPAN PETROLEUM & ENERGY WEEKLY in English Vol 16 No 38, 21 Sep 81 pp 4-6

[Text]

For the first time for an electric utility to make a total conversion from oil burning to coal-oil mixture (COM) fuel burning, Tokyo Electric Power Co. announced a plan on September 11 for shifting the existing thermal power plants at Yokosuka, Kanagawa Pref., currently burning crude and fuel oil, to those entirely burning COM fuel by 1984.

Tokyo Electric Power is also planning to introduce COM fuel burning at other thermal power plants and other electric utilities are expected to follow suit with similar plans.

With the current emphasis on increasing the industrial consumption of coal, the COM fuel is regarded as a "go-between" from oil to coal in its wider application to thermal power plants, blast furnaces, cement kilns and other industrial combustion facilities.

According to a survey report published on February 26, 1980, by the Resources Research Council, an advisory body to the director-general of the Science and Technology Agency, Japan's current potential demand for COM fuel is estimated to total 17.8 million tons annually as shown below by use. This level of COM fuel demand would consume 8.9 million tons per year of steam coal on a 50:50 coal-oil mixture basis (JPEW, March 10, 1980 - p.10).

	<u>Metric Tons/Year</u>
Thermal power plants	10.5
Blast furnaces	3.4
Cement kilns	0.9
Others	<u>3.0</u>
	17.8

According to the Tokyo Electric Power's plan submitted to the Yokosuka municipal government, the shift in fuel from fuel oil to COM will be made on the existing No.1 and No.2 plants (with a power generating capacity of 265,000 kw each) of the Yokosuka Thermal Power Station, consuming approximately 900,000 metric tons per year of COM fuel (assuming a 70 percent COM utilization rate) and saving 300,000 kiloliters per year (5,170 barrels per day) of oil.

The COM fuel to be consumed at Yokosuka is expected to be produced at a plant to be built at Onahama, Fukushima Pref., by Japan COM Co., which was established on April 1, 1981, jointly by Tokyo Electric Power Co., Electric Power Development Co. (EPDC) and five other companies (JPEW, April 13 - p.12), and will be transported by a coastal barge to Yokosuka.

Preparations for the shift for COM fuel burning will be started next month, with changes made to burners and piping and construction of desulfurization, denitrification, and dust collecting facilities started in October 1982, at an estimated total cost of ¥50 billion (\$220 million). Present plans call for starting the COM fuel burning in November 1984

for the No.1 plant and March 1985 for the No.2.

As reported previously (JPEW, March 10, 1980 - p.16), a demonstration test for COM fuel burning as partially applied to a commercial plant has been under way since March of this year at EPDC's Takehara No.1 thermal plant, Hiroshima Pref. (250,000 kw, originally designed for exclusive use of coal). The test operation will be continued for one year using two (out of 20) burners for COM fuel burning, consuming about 10 tons of COM fuel hourly.

In parallel to the demonstration test outlined above, EPDC is planning to convert its Takehara No.2 thermal power plant (350,000 kw, originally designed for exclusive use of crude/fuel oil) to one exclusively burning COM fuel by 1983. Approximately 600,000 metric tons per year of COM fuel required for the Takehara No.2 plant will be produced at a COM manufacturing plant to be built within the Nippon Kokan's steel mill at Fukuyama, Hiroshima Pref.

According to a report on the latest developments in COM fuel R&D in Japan, recently published by the New Energy Development Organization* (NEDO), there will be great economic incentives for converting the existing coal-burning boilers to COM-burning ones for boilers of 200 tons/hour or larger, while a shift from oil-burning to COM-burning is not so economically attractive as that from coal to COM. A small boiler (50 tons/hour) to be newly built for COM fuel burning does not warrant economic advantages over fuel oil burning. For further details, see the table on the next page.

(*) NEDO was established on October 1, 1980, as a joint government-industry organization under the Alternative Energy Development and Utilization Law (Law No.71 of 1980, enforced on September 29, 1980), to implement new energy development projects and overseas coal resources development.

(Continued from page 3)

(Unit: Ybillion)

<u>Estimated in July</u>	<u>Aramco Group (6 companies)</u>	<u>Non-Aramco Group (8 companies)</u>	<u>Total (14 companies)</u>
April-June 1981	-40 (-45)	-190 (-55)	-230 (-100)
July-September	-40 (-25)	-200 (-55)	-240 (-80)
April-September	-80 (-70)	-390 (-110)	-470 (-180)
<u>Updated in September</u>			
April-June 1981	-20 (-45)	-210 (-60)	-230 (-105)
July-September	-30 (-45)	-180 (-100)	-210 (-145)
April-September	-50 (-90)	-390 (-160)	-440 (-250)

Economic Viability of COM Fuel in Japan

	A = Originally designed for fuel oil burning		B = Originally designed for coal burning		New Boiler 50 tons/hr COM Burning
	A	B	A	B	
Capital expenditure for re-modelling to COM burning, ¥ mil.	5,000	1,870	1,600	830	530
Operating cost due to COM burning, excl. fuel cost, ¥ mil. (A)	1,583	993	543	336	120
(Capital cost ^(*))	(738)	(276)	(236)	(122)	(78)
(Direct cost ^(*))	(845)	(717)	(307)	(214)	(42)
Fuel consumption					
COM, tons/yr	..... 471,640	.....	..... 131,750	.....	27,190
Fuel oil, tons/yr	..... 377,030	.....	..... 107,220	.....	21,580
Fuel cost ^(**) , ¥ mil./yr					
COM (a)	..... 20,327	.....	..... 5,678	.....	1,229
Fuel oil (b)	..... 21,943	.....	..... 6,240	.....	1,351
Difference (b-a), (B)	..... 1,616	.....	..... 562	.....	122
Economic Incentive to COM, (B-A) ¥ mil./yr	33	623	19	226	2

(*) Equivalent to 250 MW.

(**) Interest, depreciation, fixed asset tax, insurance, etc. @14.75% of capital expenditures.

(+) Labor, maintenance, utility, ash disposal (@¥5,000/ton), etc.

(++) Coal price @¥15,000/ton.

Fuel oil price @¥53,000/kl for 3.0% sulfur (for boilers of 100 tons/hr or above) and @¥57,000/kl for 1.0% sulfur (for 50 tons/hr boilers).

COM price @¥43,100/ton for boilers of 100 tons/hr or above and @¥45,200/ton for 50 tons/hr boilers, including COM production cost @¥5,200/ton and transportation over a 200-km distance.

Sulfur content of fuel oil used for boilers of 100 tons/hr or above is assumed to be 3.0% because of flue gas desulfurization facilities attached to boilers, while that for 50 tons/hr boilers without such anti-pollution facilities is assumed to be 1.0%.

SCIENCE AND TECHNOLOGY

MEASURES TO PROMOTE ELECTRIC POWER PLANT CONSTRUCTION PROJECTS

Tokyo JAPAN PETROLEUM & ENERGY WEEKLY in English Vol 16 No 40, 5 Oct 81 pp 1-5

[Text]

In an effort to strengthen policy measures to facilitate construction of electric power generating plants throughout the country, the government instituted three systems of providing grant-in-aid* to local government bodies, two beginning on October 1, and the third beginning toward the end of this year:

- Grant-in-aid to prefectural governments where nuclear power generating facilities are installed.
- Grant-in-aid to prefectural governments in whose prefectures the electric power generation exceeds the electric power consumption.
- Grant-in-aid to prefectural governments where aged hydraulic power plants are in operation.

In order to implement these measures the Ministry of Finance had approved budget appropriations totaling ¥8,865 million (\$38.5 million) for expenditure in fiscal 1981 -- the first year of extending the grant-in-aid.

In the background of the institution of the three grant-in-aid systems is the government's determination to step up the electric power generating facilities -- particularly nuclear power generating facilities -- due to the growing apprehension of local residents regarding the safety and environmental impact of such large-scale projects.

Shown below is the latest available government forecast of Japan's electric power generating facilities to be installed by the end of fiscal 1990:

(*) Grant-in-aid ("Kofukin" in Japanese) differs from subsidy ("Hojokin") in that grant-in-aid is extended to a public body or its equivalent, whereas a subsidy is extended to a private body.

	End of Fiscal 1979 (Actual)		End of Fiscal 1990 (Forecast)	
	<u>1,000 kw</u>	<u>% share</u>	<u>1,000 kw</u>	<u>% share</u>
Nuclear power	14,950	12.0	51,000-53,000	22.1-22.9
Thermal power:				
Coal	4,410	3.6	23,000	10.0
LNG	18,630	15.0	43,500	18.8
LPG	600	0.5	6,000	2.6
Oil	<u>58,220</u>	<u>46.9</u>	<u>53,000-51,000</u>	<u>22.9-22.1</u>
	81,860	66.0	125,500-123,500	54.3-53.5
Hydraulic power:				
Conventional	17,690	14.2	24,500	10.6
Pumped-up storage	<u>9,520</u>	<u>7.7</u>	<u>27,000</u>	<u>11.7</u>
	27,210	21.9	51,500	22.3
Geothermal power	130	0.1	3,000	1.3
Total	124,150	100.0	231,000	100.0

As shown in the foregoing table, nuclear power and coal-burning thermal power plant capacities are expected to grow rapidly in the next decade, while the oil-burning thermal power plant capacities are expected to shrink, primarily due to the decided economic advantages inherent to nuclear and coal vs. oil, as compared below:

	Power Generating Cost* (¥ per kwh)	Scale of Plant** (1,000 kw)
Nuclear	8-9 (approx. 25%)	1,000
Coal	12-13 (approx. 50%)	790
Hydraulic (conventional)	17-18 (-)	20
Oil	17-18 (approx. 80%)	470

Outlined below are the three newly-introduced grant-in-aid systems:

(1) Grant-in-aid to prefectural governments where nuclear power generating facilities are in operation, under construction, and for which construction is planned to start by the end of fiscal 1985.

Grant-in-aid, as computed in accordance with the following scale, is extended to the prefectural governments concerned for eventual allocation to

(*) Based on a hypothetical model plant which went onstream in fiscal 1980. Percentage figures shown in brackets represent fuel cost as a percentage of total power generating cost.

(**) Based on new plants, for which construction was started in fiscal 1980 or is planned in fiscal 1981.

local residents and private enterprises in and neighboring villages and towns or for the promotion of employment opportunities. In actuality, the grant-in-aid to local residents and enterprises will be in the form of deduction from electricity bills issued by the electric power companies involved.

Rate of grant-in-aid:

<u>Power Generating Capacity (1,000 kw)</u>	<u>Local Residents (Y/household/mo)</u>	<u>Private Enterprises (Y/contr.kw/mo)</u>
Less than 1,000	300	75
1,000-2,000	400	100
2,000-3,000	500	125
3,000-4,000	600	150
4,000-5,000	700	175
5,000-6,000	800	200
6,000 or more	900	225

One-half of the foregoing rates apply to residents and enterprises in neighboring villages and towns where nuclear power generating facilities are located.

Premium rates calculated by the following formula apply to newly-built facilities:

$$\text{Premium rates} = \text{Basic rates} \times \left(1 + 0.5 \times \frac{\text{New capacity}}{\text{Total capacity (incl.new)}} \right)$$

(2) Grant-in-aid to local governments of net electricity-exporting prefectures.

In view of the fact that large-scale electric power generation projects contribute very little toward creating new employment opportunities in the areas in question, grants are intended to encourage local governments to cooperate with electric power plant projects by providing national government aid to develop employment opportunities for local residents in prefectures which satisfy the following two conditions:

- Electric power generation is 1.5 times or more of the total electric power consumed, thereby making the prefecture a net electricity-exporting prefecture.
- The areas designated for siting industrial plants under the Industry Relocation Promotion Law (Law No. 73 of 1972) account for 50 percent or more of the total area of the prefecture in question.

Moreover, nuclear power and coal-burning thermal power generating facilities, including those under construction, that are located in prefectures coming under this grant-in-aid system are designated as "special areas for inviting industrial plants" which can enjoy preferential treatment for receiving increased subsidies under the Industrial Relocation Promotion Law.

Rate of grant-in-aid:

<u>Net Export of Electricity (million kwh)</u>	<u>Grant-in-Aid (¥million)</u>
Less than 5,000	50
5,000-10,000	100
10,000-15,000	200
15,000-20,000	300
20,000 or more	400

(3) Grant-in-aid to prefectural governments for subsequent distribution to towns and villages where aged hydraulic power plants are in operation.

The legal service life of hydraulic power plants is 45 years, compared with 15 years for thermal power plants. After hydraulic power plants are in service for a number of years, property taxes raised from these facilities decline considerably, thereby bringing little economic benefit to the towns or villages involved.

In order to compensate for this disadvantage suffered by towns or villages where hydraulic power plants are located (as opposed to towns or villages where thermal power plants are located), the government has instituted a new grant-in-aid system which goes into effect late October or early November of this year. Under this system, each town or village where a hydraulic power plant has been in operation for 15 years or more, with a combined power generating capacity of 1,000 kw or more and a combined power generation of 5 million kwh or more annually, will be eligible to receive the grant-in-aid for seven years at the rate shown below in order to assist in the installation of facilities designed to alleviate the environmental impact of the hydraulic power plants.

Rate of grant-in-aid:

¥0.05 per kwh (¥0.025 per kwh generated by pumped-up storage), with a minimum amount guaranteed at ¥3 million for each town or village and a maximum amount of ¥30 million allowable for each town or village.

Apart from the three grant-in-aid systems going into effect this year, as outlined above, a grant-in-aid system designed to help improve public facilities in areas adjacent to electric power generating facilities has been in effect since fiscal 1974.

Beginning this fiscal year, facilities built by the Power Reactor and Nuclear Fuel Development Corp. to manufacture fuels for fast breeder reactors have been added to the facilities qualified to receive grant-in-aid under this system. Moreover, a fund has been established this year to facilitate maintenance of the public facilities built with grant-in-aid extended in previous years under this system.

Summarized below are the national budget appropriations under the special account for promotion of the electric power plant siting which are marked for expenditure in current fiscal 1981 (compared with those for fiscal 1980). Items marked (*) indicate those newly instituted in the fiscal 1981 budget.

		(Unit: Ymillion)	
		<u>Fiscal 1981</u>	<u>Fiscal 1980</u>
(1)	Grant-in-aid to local government cooperative with power plant projects	39,682	41,414
(2)	Environmental impact studies of nuclear power plants	14,037	10,424
(3)	Subsidies to improve nuclear power plant safety	2,538	4,440
(4)*	Grant-in-aid to local governments where nuclear power plants are in operation and under construction/planning	3,027	0
(5)*	Grant-in-aid to local governments of net electricity exporting prefectures	2,300	0
(6)*	Grant-in-aid to local governments where aged hydraulic power plants are in operation	3,538	0
(7)	Other grants-in-aid related to improvement of nuclear power plant safety	2,995	2,417
(8)	Miscellaneous	1,346	1,178
Total, Ymillion		<u>69,463</u>	<u>59,873</u>
(\$million)		(302)	(260)

The sources of funds for the foregoing budget appropriations are the revenues from the electric power development promotion tax, which was instituted in June 1974, when the so-called "Three Laws*" related to electric power development went into effect. The tax is collected from electric utilities at the present rate of ¥0.3 per kwh sold by electric utilities -- split into ¥0.215/kwh (allocated to the special account for electric power resources diversification) and ¥0.085/kwh (allocated to the special account for promotion of the electric power plant siting, referred to above.)

(*) These three laws went into effect on June 6, 1974 in order to expedite power plant construction projects, which had begun to experience construction slowdowns due to strong opposition from local residents, by providing government aid to local areas to encourage their acceptance and cooperation with these projects.

SCIENCE AND TECHNOLOGY

SJAC TEAM LEAVES FOR SOUTHEAST ASIA

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 p 2

[Text]

An eight-man team of the Society of Japanese Aerospace Companies (SJAC) left Japan in late September to tour Singapore, Indonesia, Thailand, India and Australia until Oct. 15 for study of their aerospace industries.

The tour is part of the SJAC's extensive survey of aerospace industries around the world. In FY 1980 ending last March, it reviewed the present status and future plans of space industries in Japan, North America and Europe. The current fiscal year's survey is planned to focus on developing countries.

Study subjects for the team, led by Managing Director Toshio Saijo of Nippon Electric Co., include space development organizations, space development history (satellites, rockets and other equipment), future space development programs, realities of space industries (output, exports, imports, research and development, personnel, equipment and other aspects), space development budgets, external cooperation in space development, and expectations toward Japan in the five countries.

CSO: 4120/60

MITI TO DEVELOP COMPOSITE MATERIAL TECHNOLOGY

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 pp 2, 3

[Text]

The Agency of Industrial Science and Technology, Ministry of International Trade and Industry, has selected companies which will contract with the Next-Generation Metal and Composite Material Research and Development Corporation to undertake research and development in FY 1981 of light-weight, strong and rigid composite materials for aerospace equipment, automobiles, energy equipment and other machinery.

R&D items and their contractors follow:

Fiber-reinforced plastics (FRP) materials

(1) Development of FRP materials: Toray Industries, Inc., Teijin Ltd. and Mitsubishi Chemical Industries, Ltd.

(2) Development of FRP material processing technology: Mitsubishi Heavy Industries Ltd. (MHI), Kawasaki Heavy Industries Ltd. (KHI), Fuji Heavy Industries Ltd. (FHI), Toshiba Machine Co. and Toyota Motor Co.

(3) Development of engineering technology: FHI

Fiber-reinforced metal (FRM) materials

(1) Development of FRM materials: Toray and Nippon Carbon Co.

(2) Development of FRM material processing technology: MHI, KHI, FHI and Ishikawajima-Harima Heavy Industries Co.

(3) Development of engineering technology: FHI

Development of Quality Evaluation Technology: KHI and Mitsubishi Electric Corp.

Extensive Study on Composite Materials: Next-Generation Metal and Composite Material R&D Corporation.

SCIENCE AND TECHNOLOGY

SUMITOMO DEVELOPS NEW STRINGER MANUFACTURING PROCESS

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 pp 3, 4

[Text]

Sumitomo Light Metal Industries Ltd. has developed a new heat treatment process for manufacturing of aluminum stringer used for aircraft fuselage structures.

The process can improve production yield and mechanical characteristics of products. The company has delivered more than 100 tons of stringer manufactured with the new process to Boeing Co. for large commercial transports, attracting keen attention from domestic and foreign aircraft manufacturers and airlines.

Expecting to expand sales of the improved material to domestic and foreign aircraft manufacturers, the firm has applied for a patent on the new process not only in Japan but also the United States, Canada, West Germany, Britain, the Soviet Union, South Korea and other foreign countries.

Although the fuselage stringer is required to resist fatigue and destruction, the traditional stringer has had problems with bending durability. However, stringer, if treated with the new heat-treatment process in the final manufacturing stage, could solve the problems. The improved stringer is easy to bend.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

THREE FIRMS WORKING ON BADGE PROPOSALS

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 p 4

[Text]

Nippon Electric Co. (NEC), Hitachi Ltd. and Fujitsu Ltd. have been working on their proposals for the Air Self-Defense Force's (ASDF) new BADGE automatic air defense system since the JDA solicited a proposal (RFP) on the new BADGE from each of them in August.

The three firms' representatives were invited to the ASDF's Fuchu Base Sept. 17-18 to hear the service's response to their questions on the RFP, which specifies basic requirements for the new BADGE expected to replace the current system in FY 1988. The ASDF intends to answer any questions from them fairly.

The proposals will be submitted to the ASDF by the end of January 1982 for evaluation. The prime contractor for the construction of the new BADGE system will be selected on the basis of the evaluation by the end of FY 1982. The construction will start in FY 1983 for completion in FY 1987.

The ASDF has sought ¥500 million in its FY 1982 budget request for the evaluation of the proposals and the preparation of a detailed construction schedule, in which the U.S. Air Force and Mitre Corp. will cooperate.

The service is expected to earmark the entire sum of the new BADGE construction funds, estimated at a range of ¥150,000 million to 200,000 million, in its budget request for FY 1983.

The new BADGE is designed to improve the ASDF's aircraft detection, tracking, electronic warfare and interception control capabilities with computer capacity increased to meet threats of advanced enemy aircraft.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

STEEL WORKS NAMED FOR VULCAN MODIFICATION

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 p 5

[Text]

Japan Steel Works Ltd. has been named prime contractor for the modification of the ASDF F-104J fighter's 20mm Vulcan machine gun into a ground-use antiaircraft gun system for air base defense.

Nittoku Kinzoku Kogyo, which had been another candidate for the prime contractor, will also take part in the Vulcan modification as subcontractor to undertake modification work on the turret. The prime contractor will take charge of assembly of the whole system.

The Vulcan modification program is to start in FY 1981 on a trial basis with just less than ¥100 million earmarked in the current fiscal year's budget.

Besides the modified Vulcan gun system, the ASDF plans to introduce the 20mm M-167A-1 Vulcan Air Defense System (VADS) for air base defense. After purchasing one VADS for evaluation in FY 1979, it has set aside ¥3,300 million in its FY 1982 budget request for procurement of 16 units for air base deployment through domestic license production. Japan Steel Works is also expected to be awarded the prime contract on the license production.

The ASDF intends to use the Tan-SAM short-range and portable surface-to-air missiles as well as these 20mm machine guns for air base defense. The first Tan-SAMs and portable missiles have been funded under the FY 1981 budget for training.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

PARTIAL FABRICATION OF GRX-3 TORPEDO TO END IN FY 1982

Tokyo JPE AVIATION REPORT-WEEKLY in English No 541, 7 Oct 81 p 9

[Text]

The JDA's Technical R&D Institute (TR&DI) is expected to complete partial fabrication of the GRX-3 short-range antisubmarine torpedo for the Maritime Self-Defense Force (MSDF) by the end of FY 1982 and start the full-scale development of the torpedo in FY 1983. It has earmarked Y160 million in the JDA's FY 1982 budget request for the GRX-3 program.

The GRX-3, a follow-up to the model 73 and the modified Model 73, is estimated to outstrip the U.S. Navy MK-46. It will be mounted on aircraft or surface ships to attack high-speed, deep-cruising submarines with advanced jamming capabilities.

In FY 1982, the TR&DI is expected to fabricate the propulsion system of the GRX-3 after the body is manufactured in FY 1981.

The TR&DI has also requested Y2,260 million for the third full-scale fabrication of the GRX-2 long-range homing torpedo and Y580 million for fabrication of a target tracking system for torpedo tests in FY 1982. The full-scale fabrication of the GRX-2 started in FY 1980.

CSO: 4120/60

MITI ADVISORY BODY TO STUDY Y-XX PARTNER

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 p 4

[Text]

The Ministry of International Trade and Industry (MITI) and the aircraft industry will ask the Aircraft Industry Committee of the Aircraft and Machinery Industry Council, an advisory body, to consider a possible foreign partner for Japan's development of the Y-XX 150-seat-class commercial transport in November.

Candidates for the partner are Boeing Co., the Fokker/McDonnell Douglas (MDC) group and Airbus Industrie, which have already proposed specific aircraft development projects for the Japanese Y-XX program. The Japanese industry at its top-level meeting came up with a plan to make a tentative decision on selection of the partner by the end of November. But MITI thinks that the advisory body as well as the industry should look into the problem before final selection, as was the case with Japan's international development of the Boeing 767 (Y-X).

Prior to the advisory body's consideration, the industry sent a working-level mission to the United States in early October to study details of Boeing's 7-7 and the Fokker/MDC group's MDF-100 programs presented to the Japanese last August. The team is made up of four officials each from Mitsubishi Heavy Industries Ltd. (MHI), Kawasaki Heavy Industries Ltd. (KHI), Fuji Heavy Industries Ltd. (FHI) and the Civil Transport Development Corp. They belong to a special Y-XX committee of the Society of Japanese Aerospace Companies (SJAC).

Top leaders of MHI, KHI and FHI are also expected to visit the United States in late October for the same purpose. Furthermore, FHI, which serves as manager of the Y-XX project, may send ranking officials to visit Airbus Industrie.

Based on the results of the overseas survey and the advisory body's consideration, MITI and the aircraft industry intend to make a final decision on the selection of a foreign partner by the end of this year. But Boeing and the Fokker/MDC group are reportedly expected to decide whether to go ahead with their programs in 1982 or later. They could possibly cancel or delay the programs depending on changes in prospective demand for 150-seat-class transports. Gakuji Moriya, consultant to MHI, said the Japanese should exercise prudence in the selection of a foreign partner. Thus, the possibility exists that the final decision could be delayed beyond the turn of the year.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

KEIDANREN STUDYING MILITARY TECHNOLOGY TRANSFER TO U.S.

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 p 5

[Text]

The Federation of Economic Organizations (Keidanren) will conduct a study on how to cope with the United States' earlier request for transfer of advanced Japanese communications and electronics technologies for military purposes.

Director-General Hiroshi Wada of the Japanese Defense Agency's (JDA) Equipment Bureau, during his U.S. trip in September, told U.S. Defense Department officials that Japan is ready to meet the request. But transfer of the private sector's technologies to the United States could affect Japanese industry. For example, Keidanren has warned that Japan's transfer of very large-scale integrated circuit know-how could in turn increase the U.S. semiconductor industry's international competitiveness to the disadvantage of Japanese industry. Furthermore, the private sector's military technology exports could run counter to the government's arms export ban policy.

Keidanren intends to consider these problems at its Defense Production Committee meeting. A subcommittee on the matter would be set up if necessary.

The Defense Production Committee, chaired by Gakuji Moriya, consultant to Mitsubishi Heavy Industries Ltd., will also collect the defense industry's requests regarding the FY 1981 defense budget and the new FY 1983-87 Medium-Term Defense Program to be drafted by the end of the current fiscal year. The industry is expected to seek increased JDA capital spending for procurement of firearms, ships and aircraft, and for research and development activities.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

JDA TO SIGN MT-X CONTRACT WITH KHI BY MID-OCTOBER

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 pp 8, 9

[Text]

Engineers of KHI and two other major airframe manufacturers met at KHI's Gifu Works in early October to discuss the schedule for work on the basic design of the MT-X intermediate trainer for the Air Self-Defense Force, prior to signing a work contract, around mid-October, between the JDA's Central Procurement Office (CPO) and KHI, named as prime contractor, for the MT-X development and production program.

Basic design work is planned to continue until the end of September 1982. The FY 1981 budget earmarks ¥1,596 million for the work, which would be the key to successful development of the new trainer.

After signing the contract, the prime contractor and other two firms -- MHI and FHI -- will organize an engineering team to undertake the basic design work. The team will initially consist of 98 engineers -- 46 from KHI, 29 from FHI and 23 from MHI. KHI's H. Isozaki will serve as chief engineer. The number of engineers is eventually expected to increase to 107 or so.

The engineering team will be divided into seven groups to take charge of planning, cost control, aerodynamics, structure (two groups), equipment and avionics.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

C-130H OVERHAUL CONTRACTOR TO BE SELECTED SOON

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 pp 5, 6

[Text]

The ASDF is expected to select a contractor for overhauling of the Lockheed C-130H tactical transport by the end of October, before the U.S. Air Force mission visits ASDF transport units, training schools and overhauling facilities in November to make recommendations on Japan's C-130H support setup.

KHI, Shin Meiwa Industry Co. and Japan Aircraft Mfg. Co. have declared their candidacy for the C-130H overhauling contractor. The ASDF is now reviewing present and prospective business performance of the three candidates prior to the selection.

The ASDF plans to order 12 C-130Hs under the FY 1980-84 Medium-Term Defense Program to establish a 36-plane transport fleet together with 24 C-1s. The first two C-130Hs, which will enter service in FY 1983 or later, were funded by the FY 1981 budget.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

JDA TO SELECT PRIME CONTRACTOR FOR AW-X DEVELOPMENT

Tokyo JPE AVIATION REPORT-WEEKLY in English No 542, 14 Oct 81 pp 9, 10

[Text]

The JDA plans to select a prime contractor from three firms taking part in the development of the AW-X new anti-aircraft machine gun for the GSDF. Development work is expected to start in FY 1982.

The three firms are Japan Steel Works, Ltd. for the gun barrel, Mitsubishi Heavy Industries Ltd. (MHI) for the chassis and Mitsubishi Electric Corp. for the fire control system (FCS). Japan Steel Works is the most promising candidate for the prime contractor.

So far, the JDA has not named any prime contractors for development and production of ground equipment of that kind. In the absence of prime contractors, the JDA has so far purchased gun barrels and FCS systems for supply to chassis manufacturers.

Under the traditional formula, however, problems could arise with assembly of the complete system, even though each section fulfills its own requirements. Furthermore, contractors' responsibility for projects cannot be specified.

Thus, the JDA has acknowledged that responsible prime contractors should be named for the AW-X project and subsequent ground equipment development programs. It expects the prime contractors to strive to hold AW-X development and production cost to a minimum level. It has also asked MHI and Ishikawajima-Harima Heavy Industries Co. to minimize the respective development costs for the ASM-1 air-to-ship missile and the XF-3 engine for the MT-X new trainer, establishing a policy of giving priority to cost control as well as performance in development of weapons systems.

The GSDF intends to introduce the AW-X by FY 1985 as the replacement for the L-90 35mm twin-barrel gun. The JDA's Technical R&D Institute plans to develop the AW-X by FY 1984 at a cost of ¥5,500 million. It will consist of the existing 35mm antiaircraft gun and the Model 74 tank chassis.

The new gun to be equipped with target detection radar and computerized control systems may be priced at more than ¥800 million. The GSDF wants to procure 100 units in the initial five years, and more later.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

P&W, GE MAKE SPECIFIC PROPOSALS TO JOIN RJ500 PROGRAM

Tokyo JPE AVIATION REPORT-WEEKLY in English No 543, 21 Oct 81 pp 1, 2

[Text]

Pratt and Whitney Aircraft (P&W) and General Electric (GE) have made specific proposals to Rolls-Royce and three Japanese aircraft engine manufacturers for their participation in the Rolls-Royce/Japan RJ500 aero-engine development program.

The Japanese firms - Ishikawajima-Harima Heavy Industries Co. (IHI), Kawasaki Heavy Industries Ltd. (KHI) and Mitsubishi Heavy Industries Ltd (MHI) -- intend to hold a top-level meeting with Rolls-Royce in late November or December to decide which contender to select as a new partner in the program. Thus, the RJ500 program could develop into a Japan-Britain-U.S. project by the end of this year. The Japanese believe that a U.S. aircraft engine maker's participation in the RJ500 program is indispensable for its success.

P&W has proposed that Rolls-Royce, the Japanese group and P&W each raise 30 percent of aero-engine development funds, with the remaining 10 percent put up by West Germany's Motoren und Turbinen Union (MTU) and Italy's Fiat, which took part in P&W's PW2037 program. The U.S. firm intends to integrate the PW2037 into the RJ500 program.

GE's proposal suggested that development funds be raised equally by the GE/Snecma group and the Rolls-Royce/Japan group.

The Japanese industry and the Ministry of International Trade and Industry believe that the P&W proposal for the three parties' equal participation in the program indicate a major concession by the world's largest aero-engine manufacturer. They also view the GE proposal as acceptable.

The RJ500, which was originally planned for a 120-to-130-seat commercial airliner, is now designed to power a 150-seat-class aircraft that major aircraft manufacturers of the world plan to develop. Its thrust is planned at around 11.3 tons.

P&W and GE had intended to develop engines of a similar type on their own. But they found it difficult to independently raise development funds which could total as much as ¥300,000 million. Furthermore, Boeing Co., which has proposed to develop the 150-seat-class 7-7 jointly with Japan as the Japanese-planned Y-XX, has warned that if the Rolls-Royce/Japan, GE/Snecma and P&W/MTU/Fiat groups develop engines for such aircraft separately, they would have to wage an internecine sales war. These factors have prompted the two U.S. firms to seek participation in the Rolls-Royce/Japan program.

The two U.S. firms' proposals may be studied in detail at the seventh board of directors meeting of Rolls-Royce and Japanese Aero-Engines Ltd., a joint venture for the RJ500 program, in Tokyo on Oct. 22. The Japanese are expected to call on Rolls-Royce at the meeting to select a new American partner as soon as possible in order to secure smooth headway for the program. Some Japanese industry sources said that if a U.S. partner does not take part in the RJ500 program, both the Japanese and Rolls-Royce would have to suspend it. Thus, the final decision on a U.S. partner is expected by the end of this year.

The RJ500 program is now in the initial phase for fabrication of prototypes. Full-scale development work is expected to start next year.

The Rolls-Royce and Japanese Aero-Engines board of directors meeting may also deal with a new Japanese non-profit corporation, founded on Oct. 12 to serve as the main Japanese promotor of the RJ500 program. The new corporation, named Nihon Kokuki Engine Kyokai (Japanese Aero-Engines Corp.), is to receive government subsidies for the project on behalf of the three Japanese aero-engine manufacturers. Capitalized at ¥50 million, it is owned 60 percent by IHI, 25 percent by KHI and 15 percent by MHI. IHI President Taiji Ubukata has taken the post of chairman.

Japanese airframe manufacturers hope the RJ500 will be developed as early as possible, because they see the engine development as a key to promotion of their plan to develop the Y-XX 150-seat-class transport jointly with a foreign partner. Candidates for the partnership are Boeing, the McDonnell-Douglas/Fokker group and Airbus Industrie, which have respectively proposed the 7-7, the MDF-100 and the A320 for the Y-XX program. The Japanese side is expected to select a foreign partner by the end of this year.

NATION'S AIRCRAFT MATERIAL OUTPUT STILL INSUFFICIENT

Tokyo JPE AVIATION REPORT-WEEKLY in English No 543, 21 Oct 81 pp 2, 3

[Text]

Japanese aircraft material producers are far less capable than other material manufacturers to meet domestic demand because of insufficient production facilities and technologies, but they have been increasing production actively in recent years, according to a survey report by the Society of Japanese Aerospace Companies (SJAC) on Japan's aircraft materials industry.

The ratio of domestic output to domestic demand is about 20 percent for aluminum alloy, about 60 percent for titanium alloy and about 90 percent for special steel forgings. In the sector of aluminum alloy products, Japanese manufacturers produce only some 10 percent of domestic demand for plates, and 40 to 50 percent for extrusions and forgings. Among titanium alloy products, no plates or extrusions are produced domestically, although the domestic production ratio for forgings stands at a touch more than 70 percent. As a result, Japanese aircraft material manufacturers can supply only 21 percent of the materials for Boeing 767 production.

For Japan's aircraft material consumption, aluminum materials total 3,000 tons per year, accounting for only 0.2 percent of Japan's overall aluminum consumption. The U.S. aircraft industry accounts for 5 percent of the United States' overall consumption. By the year 2000, Japanese aircraft manufacturers' annual aluminum consumption is estimated to increase to 20,000 tons.

Among other aircraft materials, Japan consumes 300 tons each of titanium alloy products and special steel forgings annually.

Domestically-produced aircraft materials are priced about 40 percent higher than imported materials on an average basis. Prices have increased for both domestically-produced and imported aircraft materials for the past several years. For example, prices of domestically-produced aluminum materials shot up 70 to 90 percent from 1977 to 1980. Prices of imported titanium prices tripled in the three years.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

MAJOR MILITARY R&D PROGRAMS PROJECTED FOR FY 1982

Tokyo JPE AVIATION REPORT-WEEKLY in English No 543, 21 Oct 81 pp 5-8

[Text]

The major military research and development programs projected by the Japanese Defense Agency (JDA) for FY 1982 (April 1982-March 1983) are:

Ground-Launched Antiship Missile

The ground-launched antiship missile for the Ground Self-Defense Force (GSDF) will be deployed at GSDF artillery units to attack enemy ships from coastal areas. It will be a ground-launched version of the Model 80 ASM-1 air-to-surface missile. The new missile will have a jet engine instead of a rocket engine for the ASM-1 to triple the target range. This is to be established as a complete weapons system by the end of FY 1981. The JDA's Technical R&D Institute (TR&DI) plans to fabricate a dummy missile, components and ground systems in FY 1982, assemble a complete system in FY 1983 and conduct the missile's technical tests in FY 1985. The development of the new missile is estimated to cost ¥19,000 million.

MT-X New Intermediate Trainer

The MT-X development program is to start with basic design work in the current fiscal year. Detailed design work and partial airframe fabrication are planned for FY 1982, fabrication of four test aircraft for FY 1983-85, and operational tests for FY 1986-87. The MT-X will serve for the Air-Self Defense Force's (ASDF) efficiency pilot training in the 1990s. Total MT-X development cost is estimated at ¥43,000 million.

XJ/ALQ-5/8 ECM Systems

The XJ/ALQ-5 electronic countermeasure (ECM) system will be installed on C-1 transports for ECM training to counter ground warning and control radar, and surface-to-air missile radar systems. The XJ/ALQ-5 development program started in FY 1980. The new system will be fabricated in FY 1982, installed on a C-1 in FY 1984 and tested in FY 1984-85. Total development cost is estimated at V3,500 million.

The XJ/ALQ-8 ECM system will be mounted on the F-15J fighter-interceptors to jam aircraft fire control systems, surface-to-air missiles and other electronic systems. In FY 1982, the F-15J airframe will be modified to accommodate the ECM system.

Air Combat Missile

The air combat missile for engineering research is an infrared homing air-to-air missile which will be mounted on fighter aircraft for dogfights. It will be more advanced than the AIM-9L Sidewinder. Partial fabrication was carried out from FY 1978 to 1979 and tests of fabricated parts will be conducted in FY 1981. In FY 1982, the airframe, rocket motor and servo combuster will be fabricated. Partial fabrication will continue in FY 1983 as well. Total research cost is estimated at V2,000 million.

Portable SAM

The portable surface-to-air missile for engineering research is designed as a small, lightweight antiaircraft missile for air defense of the Ground, Maritime and Air Self-Defense Forces. It will feature image homing guidance, limitless firing directions and fire-and-forget characteristics. The engineering research on the portable SAM was first funded in FY 1979. In FY 1982, the TR&DI will fabricate a test airframe, a guidance system and other parts, expecting the three SDF services to request engineering development of the new missile in FY 1984. The TR&DI's research cost is estimated to total V2,500 million.

IRCCD for New FLIR System

The infrared-charge coupled device (IRCCD) is necessary for the next-generation forward-looking infrared (FLIR) system to improve night battle capability. The IRCCD will also be used for the homing head of the portable SAM. It will feature all-weather capability. The IRCCD research

program was first funded in FY 1981. Under the FY 1982 funding, the TR&DI will complete the initial phase of the program. It plans research on a higher-performance IRCCD for FY 1987-88. Total research cost is estimated at \$2,000 million.

Electronic Warfare Simulator

The radar electronic warfare simulator will be used for research and development of equipment for complicated radar electronic warfare. The TR&DI will start fabrication of an ECM/ECCM (electronic counter countermeasure) simulator and other equipment in FY 1982 after initial research in FY 1979-80 and construction of a building for the simulator in FY 1981. The simulator will become operational in FY 1984. The simulator program is estimated to cost \$1,400 million.

Future Fire Control System

The TR&DI plans to establish the active phased array antenna technology for a future fire control system (FCS) aboard a fighter to cope with low-altitude flying multiple enemy aircraft. The FCS is also designed for a control-configured vehicle (CCV) aircraft now in development. The TR&DI intends to fabricate the antenna in FY 1981 and commission a private firm to study it in FY 1982. After further research, the antenna will be mounted on an aircraft for airborne tests.

Nike-Phoenix SAM

The TR&DI conducted initial research on the Nike-Phoenix as a candidate for replacement for the ASDF Nike-J surface-to-air missile system in FY 1976-77. It is a mixture of the Nike-J and the Hughes Phoenix air-to-air missile system. In FY 1982, the TR&DI will conduct final research on the new missile system prior to the ASDF's decision on the Nike-J replacement.

New Antimortar Radar

The TR&DI will develop a new antimortar radar as a replacement for the current GE JAN/MPQ-N1 from FY 1982 to 1983. The new radar will use integrated circuits instead of electronic tubes, and detect multiple targets within a wider range. For increased mobility, the new radar can be mounted on vehicles and carried by helicopters.

Towed Array Sonar System

The towed array sonar system (TASS) will have passive detection capability to make up for a shortfall in the active sonar's submarine search capability. Based on past research results, the TR&DI will fabricate a complete system in FY 1982 and 1983. The TASS development project is estimated to cost \$1,200 million.

SCIENCE AND TECHNOLOGY

TR&DI TO DESIGN AIRCRAFT SYSTEM SIMULATOR IN FY 1982

Tokyo JPE AVIATION REPORT-WEEKLY in English No 543, 21 Oct 81 p 8

[Text]

The JDA's TR&DI is eager to get ¥60 million approved under the FY 1982 budget for its initial design work on an aircraft system simulator which is indispensable for future development of aircraft. The simulator program was disapproved under the FY 1981 budget.

If the design work is funded, the TR&DI plans to fabricate the cockpit and the software equipment in FY 1983 and 1984, and the display system in FY 1984 and 1985. Completion of the simulator is expected for FY 1985. Total cost for the four-year simulator construction program is estimated at just less than ¥5,000 million.

The simulator is designed to evaluate all possible new functions and components for small aircraft such as fighters with computers. The TR&DI wants the simulator to have combat simulation capability if possible.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

TR&DI TO DEVELOP NEW TARGET DRONE BY FY 1986

Tokyo JPE AVIATION REPORT-WEEKLY in English No 543, 21 Oct 81 pp 8, 9

[Text]

The JDA's Technical R&D Institute (TR&DI) plans to develop a new target drone for the ASDF from FY 1982 to 1986. It has requested ¥137 million for fabrication of the 300-to-400-kilogram-thrust jet engine for the drone in the initial year or in FY 1982.

In the second year or in FY 1983, the TR&DI intends to start manufacture of several prototype airframes costing ¥1,600 to 1,700 million prior to technical tests in FY 1985-86.

The Ground and Maritime Self-Defense Forces (GSDF and MSDF) as well as the ASDF are expected to adopt the new target drone if it is developed successfully.

The new drone is designed to serve as a target for missile firing exercises using the ASDF's F-15J and F-4EJ fighter-interceptors. For the immediate future, the ASDF intends to introduce the Teledyne/FHI BQM-34J drone for the F-15J's missile exercises. But this drone is priced at as much as ¥150 million. Furthermore, it must be recovered by ships and repaired for repeated use. Thus the BQM-34J has problems with economy. In contrast, the new drone to be developed by the TR&DI will be disposable and priced at less than the ¥30-to-40-million Northrop Chukar-II which the GSDF and MSDF are to introduce.

The new drone will also feature airborne launching, preprogrammed flights and high maneuverability.

If the new drone program is authorized, FHI and KHI would vie as prime contractor for the program. For the jet engine, KHI and MHI are expected to compete for a development contract.

AIRCRAFT INDUSTRY STUDYING THREE Y-XX PROPOSALS

Tokyo JPE AVIATION REPORT-WEEKLY in English No 544, 28 Oct 81 pp 4, 5

[Text]

The Japanese aircraft industry has started full-scale studies of three foreign proposals for the Japanese-planned development of the Y-XX 150-seat-class commercial transport aircraft as it has completed negotiations with Boeing Co., the McDonnell Douglas/Fokker group and Airbus Industrie on details of their respective proposals.

It intends to decide by late November which proposal should be adopted for the Y-XX project.

The detailed negotiations with Boeing and the McDonnell Douglas/Fokker group took place in the United States in early October. Four members of the Y-XX special committee of the Society of Japanese Aerospace Companies (SJAC) visited McDonnell Douglas Oct. 6-7 and Boeing Oct. 8-9, returning home Oct. 13. Boeing and the McDonnell Douglas/Fokker group have proposed the 7-7 and the MDF-100 respectively as the Y-XX for joint development. Talks with Airbus Industrie, which has proposed the A320, were held in France when Chairman Iwao Shibuya and other members of the special committee visited there in late September.

While considering the three proposals, the Japanese industry is surveying the possible world market for 150-seat-class transports. The committee is to send a market survey mission to the United States possibly late in October because future aircraft procurement plans of major U.S. carriers, including Delta Air Lines and United Airlines, are seen as a key to the development of the 150-seat-class airliner.

The industry is also considering what aircraft sections the Japanese should undertake in the international development of the Y-XX. It has been consulting closely with MITI,

expecting government subsidies for the Y-XX project. If the Japanese take charge of fuselage sections and the main wing fairing, as is the case with the Japan-Boeing-Italy development of the Boeing 767 (Y-X), new investment in plant and equipment could be lowered to reduce financial risks. But the government is not expected to appropriate subsidies for so simple a venture. So far, the industry has come up with no definite policy on Japan's share of the international Y-XX development.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

NEW FIRM TO FABRICATE RJ500 PROTOTYPES IN FY 1981-1982

Tokyo JPE AVIATION REPORT-WEEKLY in English No 544, 28 Oct 81 p 5

[Text]

Japanese Aero-Engines Corp., established on Oct. 12 for Japan's joint development of the RJ500 (XJB) aircraft engine with Rolls-Royce Ltd., will fabricate bench-test versions of the engine in FY 1981-82, taking over business of the XJB office of the Engineering Research Association for Aerojet Engines, according to its business plans.

Running tests of the bench-test engines are scheduled to start in FY 1982.

The new corporation's budget is fixed at ¥4,251.9 million (including ¥2,800 million in government subsidies) for FY 1981, ending in March 1982, and at ¥8,000 million (¥5,400 million) for FY 1982.

Other business planned for the initial two years includes preparation of a detailed RJ500 development schedule; coordination of development work; study of technology; preparation of a detailed design for the bench-test prototypes; preparation of a schedule for testing the fans, low-pressure turbines, and other major engine components; pre-development tests on the major engine components; fabrication of tools for the tests; manufacture of machine tools for fabricating bench-test engines; and fabrication of spare parts for these engines.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

SHIN MEIWA, NIPPI WILL NOT PARTICIPATE IN MT-X PROGRAM

Tokyo JPE AVIATION REPORT-WEEKLY in English No 544, 28 Oct 81 pp 5, 6

[Text]

Shin Meiwa Industry Co. and Japan Aircraft Mfg. Co. (NIPPI) are expected to take no part in mass production of MT-X new intermediate trainers for the Air Self-Defense Force (ASDF) starting in 1987. This is because Kawasaki Heavy Industries Ltd. (KHI), as prime contractor for MT-X development and production, cannot afford to let them undertake part of its limited share in the program.

KHI, though named prime contractor for the ¥300,000 million MT-X program, has been given a share of only 40 percent in the program, with Mitsubishi Heavy Industries Ltd. (MHI) and Fuji Heavy Industries Ltd. (FHI) named to undertake the remaining 60 percent equally. KHI's 40 percent share covers the front fuselage section and final assembly. Thus, KHI has no work to subcontract to Shin Meiwa and NIPPI.

Although KHI wants to let Shin Meiwa and NIPPI produce the auxiliary fuel tank, the pylon and other minor parts, the two firms may not be given any substantial subcontracts for the MT-X production.

If no subcontract for the MT-X production is given to Shin Meiwa, it would have to greatly shrink its aircraft division. The airframe manufacturer had expected to receive orders for US-1 rescue flying boats from the Maritime Self-Defense Force (MSDF) and gain a subcontract for the MT-X production. But the MSDF has not sought any US-1s in its budget request for FY 1982. Thus, no work could be given to Shin Meiwa's aircraft manufacturing line.

NIPPI would manage to keep its aircraft manufacturing line operational, thanks to its contracts with the U.S. Forces in Japan for aircraft overhaul.

The MT-X program's development phase is to start in the current fiscal year with work on a basic design.

SCIENCE AND TECHNOLOGY

THREE FIRMS VYING FOR C-130H AIRFRAME OVERHAUL

Tokyo JPE AVIATION REPORT-WEEKLY in English No 544, 28 Oct 81 pp 6, 7

[Text]

KHI, Shin Meiwa and NIPPI have been vying for the ASDF's contract to overhaul the airframe of the Lockheed C-130H tactical transport plane which the ASDF will introduce in FY 1983.

The ASDF and JDA internal bureaus are now facilitating selection of contractors for overhauling the airframe and six other parts of the C-130H, because the contractors must be ready for the visit to Japan, in November, of a U.S. Air Force/Lockheed C-130H survey team.

The selection will be subject to the tentative decision of the JDA Deputy Director-General or Vice Minister for Defense and to JDA's coordination with the Ministry of International Trade and Industry under the Aircraft Manufacturing Industry Law. The final decision will come by the end of October.

The ASDF has nearly settled on contractors for overhauling the six other C-130H parts. They are Ishikawajima-Harima Heavy Industries Co. (IHI) for the engine, Sumitomo Precision Products Co. for the propeller, Tokyo Aircraft Instrument Co. for the auto pilot system, Toshiba Corp. for the inertial navigation system, Tokyo Aircraft Instrument for the flight director and IHI for the fuel control system.

CSO: 4120/60

MITI TO DEVELOP RESOURCES SURVEY SATELLITE

Tokyo JPE AVIATION REPORT-WEEKLY in English No 544, 28 Oct 81 p 10

[Text]

The Ministry of International Trade and Industry (MITI) will start full-scale development of an earth resources survey satellite in FY 1982, with launching projected for FY 1987.

In the initial year, it will complete preliminary design of the satellite system based on past conceptual research. In FY 1983, MITI will begin to prepare a basic design and fabricate the satellite, resources survey sensors, a ground check-out system and tracking/control facilities. If the satellite system enters operation, Japan would become the world's third country to have an earth resources survey satellite following the United States and France. The United States has already launched three Landsat satellites for resources observation, while France has been developing a similar satellite for completion in 1984.

The Japanese satellite will be launched by the new two-stage H-1 rocket, now in development, from the Tanegashima Space Center of the National Space Development Agency (NASDA) in southwestern Japan. The satellite will occupy a solar synchronous orbit at an altitude of about 560 kilometers. The satellite will be equipped with synthetic aperture microradar, optical sensors and other instruments. The synthetic aperture radar will bounce microwaves off the earth's surface and receive reflected waves, even through cloud formations, to collect surface data. The optical sensors will collect three-dimensional data through electronic scanning. Other instruments will include the visible infrared radiation measurement system, which will enable a minimum resolution of only 20 meters, compared with 80 meters for the Landsat. The French satellite has almost the same degree of resolution as the Japanese version.

With the earth resources satellite to detect areas rich in natural resources, MITI expects to satisfy the requests of resource-rich developing countries for Japanese resources survey work and secure a stable supply of resources for Japan from these other nations.

SCIENCE AND TECHNOLOGY

SEVENTH RRJAEI BOARD MEETING HELD IN TOKYO

Tokyo JPE AVIATION REPORT WEEKLY in English No 545, 4 Nov 81 pp 2, 3

[Text]

The seventh board meeting of Rolls-Royce and Japanese Aero Engines Limited (RRJAEI) held in Tokyo toward the end of October confirmed that it has been discussing possible participation of a third party in the RJ500 engine development program.

The major American aircraft engine manufacturers, Pratt and Whitney Aircraft Division of United Technologies (P&W) and General Electric (GE), have reportedly approached Rolls-Royce Limited of the United Kingdom and three Japanese manufacturers (IHI, KHI and MHI) for possible participation in the Anglo-Japanese engine program targeted for production of medium-size, new-generation aircraft.

No conclusion was reached at the board meeting as to which American manufacturer should be invited to join the program, but it was agreed that the discussion will be continued by top leaders of the British and the Japanese partner companies.

The board of RRJAEI agreed at the meeting that there is a strong requirement for a new 150-seat aircraft with a high technology engine, and confirmed that the RJ500 development program, including manufacturing of the first two demonstrator engines which are due to be run early 1982, and the component rig program have been carried out satisfactorily in accordance with the already approved working schedule.

Prior to the board meeting, top executives of the British and the Japanese manufacturers had reportedly agreed that the full launching of the engine development, which was scheduled to begin in December 1981 would be delayed, judging by the current situation for new 150-seater aircraft development programs being planned by world aircraft manufacturers. It was also agreed that the present basic agreement covering the activities of the joint venture company would accordingly be extended for another year.

SCIENCE AND TECHNOLOGY

CTDC TO DRAFT BASIC Y-XX DESIGN BY MARCH

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 pp 3, 4

[Text]

The Civil Transport Development Corp. (CTDC) is hopeful of drafting a basic design for the Y-XX new 150-seat-class commercial transport by the end of March 1982.

CTDC's Y-XX development preparation office has been working on the basic design since last August, while the Japanese aircraft industry has been seeking a foreign partner for joint development of the aircraft. This is because Japan should have its own design in order to make future negotiations with the partner favorable to the Japanese. Funds set aside for the basic design work total ¥470 million, of which government subsidies account for 75 percent. The Japanese industry intends to launch full-scale development work on the Y-XX in FY 1982 with funds aggregating ¥2,000 million, including government subsidies.

The basic design work has been undertaken by two engineers each from Mitsubishi Heavy Industries Ltd., Kawasaki Heavy Industries Ltd. and Fuji Heavy Industries Ltd. Wind tunnel and fatigue tests may be conducted as part of the work. Improved fuel efficiency and noise reduction are planned as main features for the new transport.

Three new aircraft have been proposed by foreign aircraft manufacturers for Japan's Y-XX. They are the Boeing 7-7 of Boeing Co., the MDF-100 of McDonnell Douglas Corp. and Fokker, and the A320 of Airbus Industrie. These aircraft have been devised in line with requirements of potential U.S. users, including Delta Air Lines and United Airlines.

The foreign partner for the Y-XX development program will be selected from these manufacturers.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

MT-X PROGRAM TO COST FORTY-THREE BILLION YEN

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 pp 8, 9

[Text]

The JDA's TR&DI has revised the estimated cost for the seven-year development of the ASDF MT-X new intermediate trainer from the original ¥37,200 million in FY 1980 prices to ¥43,000 million at FY 1981 prices.

But this estimate does not include the cost for fabrication of five prototypes of the XF-3 small turbofan engine which is now in development for the MT-X. If the XF-3 is formally named to power the new trainer, the cost would be incorporated into the MT-X program cost. As a result, the actual overall cost for the MT-X development program would reach nearly ¥50,000 million.

The initial MT-X program funding, furnished in FY 1981, totaled ¥1,596 million for work on the basic MT-X design. In the FY 1982 budget request unveiled late last August, the TR&DI sought ¥7,358 million for basic and detailed design work plus fabrication of full-size mock-up and front fuselage sections for tests.

In FY 1983, TR&DI will request funds for fabrication of four prototype aircraft for technical and operational tests between late FY 1985 and FY 1987 when the MT-X development program will be completed.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

GRX-2 TORPEDO DEVELOPMENT TO BE COMPLETED BY FY 1984

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 p 9

[Text]

The JDA's Technical R&D Institute (TR&DI) plans to complete the development of the GRX-2 high-speed long-range homing torpedo for the MSDF by FY 1984 at a cost of ¥11,800 million.

TR&DI has asked the Ministry of Finance to earmark ¥2,260 million in the FY 1982 budget for final full-scale fabrication. Technical tests are planned for late FY 1983 and operational tests for FY 1984 before service entry certification.

The TR&DI has designed the GRX-2 for mounting on submarines to attack deep-cruising, high-speed enemy submarines with high accuracy. The GRX-2 was adopted for research in FY 1970. Its full-scale development started in FY 1980.

The TR&DI has also been developing the GRX-3 (modified Model 73) short-range torpedo for aircraft and surface ships.

Authorized funds for the two torpedo development programs totaled ¥2,400 million in FY 1980 and ¥4,600 million in FY 1981. For FY 1982, the TR&DI has requested ¥3,000 million, including ¥2,260 million for the GRX-2 program. In addition, it has sought ¥580 million for a target tracking system which would be used for testing torpedoes.

CSO: 4120/60

SCIENCE AND TECHNOLOGY

GUIDED WEAPONS FOR R&D IN FY 1982

Tokyo JPE AVIATION REPORT-WEEKLY in English No 545, 4 Nov 81 p 10

[Text] The JDA's Technical R&D Institute (TR&DI) in its FY 1982 budget request has sought ¥9,635 million, including ¥8,109 million for disbursement from FY 1983 on, for eight research and development programs for guided weapons systems, such as the XSSM-1 ground-launched antiship missile for the GSDF, the Chu-MAT medium-range antitank missile for the GSDF, the air combat missile for the ASDF and the portable surface-to-air missile for the three services.

The XSSM-1 development program is estimated to cost ¥19,000 million, of which the TR&DI has earmarked ¥7,760 million in the FY 1982 budget request for fabrication of dummy components and ground systems. Fabrication of a full system will start in FY 1983. The program is planned for completion with technical tests in FY 1985. The GSDF will use the XSSM-1, based on the ASDF ASM-1 air-launched antiship missile, for coastal defense.

The laser semiactive Chu-MAT antitank missile will be developed at a cost of ¥8,000 million by FY 1984. The FY 1982 budget request earmarks ¥62 million for the first-phase fabrication.

The air combat missile program is planned to go into full-scale development stage in FY 1985 after technical research between FY 1978 and 1984. The FY 1982 budget request includes ¥540 million for part of the technical research. This missile will be used for fighter aircraft dogfights with intruding planes. It will be an advanced infrared guided missile to replace the AIM-9L Sidewinder. Its research and development costs are estimated to total ¥2,000 million.

Technical research on the image-homing portable SAM has been under way since FY 1979. In FY 1982, a prototype will be test-fired, with past research results evaluated. Funds for such work in FY 1982 total ¥260 million. Full-scale development is expected to start in FY 1984. Overall costs for the portable SAM research and development are estimated at ¥2,500 million.

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